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Janice S. Williams

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WILLIAMS, JANICE SOUTHERLAND

AN ANALYSIS OF SELECTED PSYCHOLINGUISTIC INSTRUCTIONAL  
AIDS FOR THE REMEDIATION OF LEARNING DEFICIENCIES AMONG  
EARLY ELEMENTARY CHILDREN

East Tennessee State University

ED.D.

1981

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AN ANALYSIS OF SELECTED PSYCHOLINGUISTIC  
INSTRUCTIONAL AIDS FOR THE REMEDIATION  
OF LEARNING DEFICIENCIES AMONG EARLY  
ELEMENTARY CHILDREN

---

A Dissertation  
Presented to  
the Faculty of the Department  
of Supervision and Administration  
East Tennessee State University

---

In Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Education

---

by  
Janice Southerland Williams

May 1981

APPROVAL

This is to certify that the Advanced Graduate Committee of

JANICE SOUTHERLAND WILLIAMS

met on the

13th day of April, 1981.

The committee read and examined her dissertation, supervised her defense of it in an oral examination, and decided to recommend that her study be submitted to the Graduate Council and the Dean of the School of Graduate Studies in partial fulfillment of the requirements for the degree Doctor of Education.

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Chairman, Advanced Graduate Committee

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Albert C. Haynes

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William H. L. L. L.

Signed on behalf  
of the  
Graduate Council

C. L. Brantlett

Dean, School of Graduate Studies

## Abstract

# AN ANALYSIS OF SELECTED PSYCHOLINGUISTIC INSTRUCTIONAL AIDS FOR THE REMEDIATION OF LEARNING DEFICIENCIES AMONG EARLY ELEMENTARY CHILDREN

by

Janice Southerland Williams

The problem was to determine whether selected psycholinguistic instructional aids were effective in remediating learning deficiencies among early elementary children (grades 1-3).

Literature was reviewed to substantiate a need for the use of psycholinguistic instructional aids for remediation of learning deficiencies among early elementary children. Research surveyed included auditory perception skills, language skills, motor skills, and visual perception skills.

Data were collected from test groups of students in grade levels one, two, and three. A stratified random sampling technique yielded a sample of thirty-six students, eighteen males and eighteen females. Each of the three grade level groups in the sample was divided randomly into two groups containing an equal number of males and females. These groups were labeled the experimental groups and the control groups.

The Illinois Test of Psycholinguistic Abilities (ITPA) was administered as a pretest to the sample. A series of reading lessons was taught for an instructional period of twenty-one sessions to both experimental and control groups. The experimental groups were provided thirty-minute sessions of prescribed psycholinguistic instructional aids following the presentation of each reading lesson. The control groups received "pseudo" treatment designed to control for the Hawthorne effect. The ITPA was re-administered as the post-test.

No significant difference was found between the scores achieved on the ITPA for the experimental groups and the control groups for grade levels one, two, or three. There

was no significant difference found between the scores for the composite experimental group and the composite control group. The 0.05 level of significance was applied in all cases using the statistical technique of analysis of covariance with the pretest as the covariate.

The comparison of experimental groups and control groups found that: (1) The experimental groups for all grade levels showed higher increases than the control groups. (2) The composite experimental group showed an increase over the composite control group.

The comparison of male and female control and experimental groups found that: (1) The male experimental groups showed an increase over the male control groups with the exception of the second grade level where the control group was slightly favored. (2) The female experimental groups showed an increase over the female control groups in all grade levels. (3) The female experimental groups, including the composite experimental group, showed a gain over the male experimental groups.

The recommendations made as a result of the study were: (1) Additional studies should be conducted using larger samples and/or longer durations of time to determine whether selected psycholinguistic instructional aids were effective in remediating learning deficiencies. (2) Replication of the study should be made in other geographical areas using different research designs and methodologies in order to increase the ability to generalize the results. (3) Studies should be conducted with middle and upper elementary school children to determine whether psycholinguistic instructional aids were effective for the remediation of learning deficiencies at those grade levels. (4) Schools should use evaluation instruments such as the Illinois Test of Psycholinguistic Abilities to assess students' psycholinguistic abilities and incorporate the findings into staff development programs and professional growth activities. (5) Studies should be conducted on the impact of psycholinguistic instruction on students' self-concepts. (6) Studies should be conducted to determine if paraprofessionals could enhance students' psycholinguistic performance.



Institutional Review Board

This is to certify that the following study has been filed and approved by the Institutional Review Board of East Tennessee State University.

Title of Grant or Project An Analysis of Selected Psycholinguistic Instructional Aids for the Remediation of Learning Deficiencies Among Early Elementary Children

Principal Investigator Janice Southerland Williams

Department Supervision and Administration

Date Submitted June 24, 1980

Principal Investigator Janice Southerland Williams

Institutional Review Board Approval,

Chairman For the Signature NO

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## DEDICATION

This study is dedicated to my beloved husband, Walter Rollin Williams, III, and my dear sons, Walter Rollin Williams, IV, and David Southerland Williams, who gave me the encouragement and support required for this endeavor.

## ACKNOWLEDGMENTS

I would like to express my heartfelt thanks to Dr. A. Keith Turkett, committee chairman, for his unfailing support in the achievement of an educational goal. His willingness to listen to problems encountered and to discuss the study at any and all times will be remembered always and appreciated.

Special thanks go to Dr. John Taylor and Dr. Albert Hauff. Dr. Taylor's expertise in the use of the Illinois Test of Psycholinguistic Abilities and his help in securing qualified personnel for testing were invaluable to the study. Dr. Hauff's direction in the statistical procedures for the research was greatly appreciated.

Dr. Charles Burkett and Dr. William Fowler aided much in this endeavor. I appreciated their professional guidance.

Miss Elaine Gerace and Mrs. Novice Gross, the University School, East Tennessee State University, contributed immeasurably to the study. Their unflagging support and friendship will be remembered with deep appreciation.

The testing for the research project was conducted by Miss Beth Ann Bolt, Ms. Bette Baldwin, Mrs. Linda Miller, and Mrs. Katherine Marbois-Segall. Others who provided help in the study were Mrs. Amelia Schumaier, Office of Computer Services, East Tennessee State University, and Miss Martha Littleford and Mrs. Pam Williams, typists. These people made the completion of the study possible.

I would like also to thank my parents, in-laws, relatives, teachers, and friends who through the years expressed confidence in my abilities and displayed faithful support of my efforts.

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## Chapter 1

### THE PROBLEM

#### Introduction

The development of language, according to Joseph F. Kess,<sup>1</sup> has perhaps been the most important influence upon man. Language, because of its quality of abstraction, was the essence of communication which distinguished human beings from other animals. Kess wrote in 1976 that abstraction enabled man to "use language for planning and reminiscing as well as for conversing."<sup>2</sup> Man's later development of written representation of language provided him an unchanging and accurate method for external memory. Kess stated that although the world could be interpreted in many different ways, every human language was developed in a rather precise fashion.<sup>3</sup> He concluded, therefore, that the speakers of a particular language had common points of reference.<sup>4</sup>

Psycholinguistics, with its emphasis upon the investigation of abilities, involved the human capacity called language and investigation of the actual use of language by human beings. It was a relatively recent field of study.

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<sup>1</sup>Joseph F. Kess, Psycholinguistics: Introductory Perspectives (New York: Academic Press, 1976), p. 1.

<sup>2</sup>Kess, p. 1.

<sup>3</sup>Kess, p. 1.

<sup>4</sup>Kess, p. 1.

according to Kess.<sup>5</sup> The scope of psycholinguistic subject matter included whatever pertained to the fuller understanding of language behavior.<sup>6</sup>

C. E. Osgood and T. A. Sebeok stated that psycholinguistics, in the broadest sense, was concerned with the relationships between messages and the characteristics of human individuals who selected and interpreted them.<sup>7</sup> In a narrower sense, Osgood and Sebeok stated that psycholinguistics included the processes whereby the intentions of speakers were transformed into signals in culturally-accepted codes and whereby signals were transformed into the interpretations of hearers.<sup>8</sup>

The phrase "interpretations of hearers," used by Osgood and Sebeok, referred to individual and group differences among human beings. The term individual differences, in reference to academic achievement, developed into two usages according to Samuel A. Kirk and Winifred D. Kirk.<sup>9</sup> One term referred to interindividual differences, namely those of variability among members of a group. A measurement of this variability was a mental ability test or a reading score

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<sup>5</sup>Kess, p. xi.

<sup>6</sup>Kess, p. xi.

<sup>7</sup>C. E. Osgood and T. A. Sebeok, eds., Psycholinguistics: A Survey of Theory and Research Problems, Indiana University Publications in Anthropology and Linguistics, Memoir 10 (Bloomington: Indiana University Press, 1954), p. 3.

<sup>8</sup>Osgood and Sebeok, p. 4.

<sup>9</sup>Samuel A. Kirk and Winifred D. Kirk, Psycholinguistic Learning Disabilities: Diagnosis and Remediation (Urbana: University of Illinois Press, 1972), p. 11.

which considered a classification of interindividual differences for the placement of children into groups according to abilities.<sup>10</sup>

A second term, intraindividual differences, referred not to the comparison of one child with another, but to differences within individual children. Kirk and Kirk stated that intraindividual differences led logically to psychometric tests which measured a number of specific and discrete areas of psychoeducational development.<sup>11</sup>

The Illinois Test of Psycholinguistic Abilities was developed at the University of Illinois as a comparable diagnosis for intraindividual testing of psychological and linguistic functions. Its principal use was to diagnose children's psycholinguistic abilities for the purpose of remediation.<sup>12</sup>

The ultimate key which opened the way to success in coping with language deficiencies, stated Beth A. Slingerland, was the teacher's work with children.<sup>13</sup> She stressed that without the teacher all the research and diagnosis were of little value to children waiting to be taught.<sup>14</sup>

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<sup>10</sup>Kirk and Kirk, p. 11.      <sup>11</sup>Kirk and Kirk, p. 12.

<sup>12</sup>Kirk and Kirk, p. 12.

<sup>13</sup>John I. Arena, ed., Teaching Educationally Handicapped Children (San Rafael, California: Academic Therapy Publications, 1967), p. 82.

<sup>14</sup>Arena, p. 82.

The Right to Education Movement in the early 1970's and the passage of the Education for All Handicapped Children Act in 1975, Public Law 94-142 (Appendix A), charged supervisors and teachers with the responsibility of teaching all children.<sup>15</sup> Two primary objectives of teachers were to delineate abilities and to ameliorate deficits in academic achievement. The diagnosis of psycholinguistic deficiencies and remediation of deficits through selected instructional aids were considered important steps in achieving the mandated rights of children and the correlative professional responsibility of educators.

Elementary supervisors assisted teachers in achieving the rights of children and in fulfilling professional responsibilities. They aided them in meeting the demands placed upon regular classroom teachers summarized by the Commission on Education for the Profession of Teaching as developing

professional teacher-scholars capable of high levels of diagnosis and prescription; coordinating the instructional efforts of other professionals and para-professional associates; and exercising responsibilities in school, community, and the profession. Continuing professional development aims at proficiency, at mastery, even at brilliance in the performance of instructional responsibilities.<sup>16</sup>

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<sup>15</sup>Mary McCluskey McCaffrey, "Professional Responsibilities and the Rights of Handicapped Children: The Development of a Training Curriculum for School Personnel" (Ed.D. dissertation, The George Washington University, 1977), p. 1.

<sup>16</sup>R. B. Howsum and others, Educating a Profession. Report of the Bicentennial Commission on Education for the Profession of Teaching (Washington, D.C.: American Association for Colleges for Teacher Education, 1976), p. 103.

### Statement of the Problem

The problem was to determine whether selected psycholinguistic instructional aids were effective in remediating learning deficiencies among early elementary children (grades 1-3).

### Limitations of the Study

The following limitations of the study were recognized:

1. The study was limited in scope by considering only those psycholinguistic deficiencies tested by the Illinois Test of Psycholinguistic Abilities.
2. The remediation of noted psycholinguistic deficiencies was limited to an instructional period of twenty-one thirty-minute sessions during the fall of 1980.
3. The population of the study was limited to students enrolled for the academic year 1980-81 in the early elementary levels of the University School, East Tennessee State University, Johnson City, Tennessee.

### Assumptions

The assumptions pertinent to the study were as follows:

1. The instructors, student teachers, and undergraduate and graduate students were qualified for their assigned tasks.
2. The Illinois Test of Psycholinguistic Abilities was a valid and reliable instrument to diagnose psycholinguistic



deficiencies among the early elementary children of the University School.

### Definitions of Terms

The terms were defined for the purpose of the study as follows:

#### Attention

Attention is "the ability to concentrate on a task long enough to localize and receive the essential features of the stimuli."<sup>17</sup>

#### Auditory Association

Auditory association refers to "the ability to associate spoken words in a meaningful way, and it deals with the auditory process of interpreting relationships."<sup>18</sup> Some techniques associated with auditory association are: identifying likeness and difference, problem solving, categorizing and classifying, predicting the outcome of stories, finding opposites, and identifying relationships.<sup>19</sup>

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<sup>17</sup>Gerald Wallace and James A. McLoughlin, Learning Disabilities (Columbus, Ohio: Charles E. Merrill, 1975), p. 31.

<sup>18</sup>Wilma Jo Bush and Marian T. Giles, Aids to Psycholinguistic Teaching (Columbus, Ohio: Charles E. Merrill, 1977), p. 67.

<sup>19</sup>Bush and Giles, pp. 72-76.

### Auditory Discrimination

Auditory discrimination is "the ability to distinguish between the phonemes which are the concepts of the smallest unit of speech which makes a meaningful difference in language."<sup>20</sup>

### Auditory Memory

Auditory memory from auditory stimuli is "the ability to bring forth a verbal response, and the time between intake and response."<sup>21</sup> It refers to the capacity "to remember words, sounds, or sentences one has heard."<sup>22</sup> Techniques associated with auditory memory are: alphabetical word sequencing, instruction sequencing, and rhyming words in sequencing.<sup>23</sup>

### Auditory Reception

Auditory reception is

the process of recognizing and/or understanding what is heard. It is one of the auditory functions which involves decoding information that is symbolic or representational.<sup>24</sup>

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<sup>20</sup>David D. Dukes, "A Study Comparing Measures of Auditory Discrimination to Other Measures Relative to Reading Achievement" (M.A. thesis, East Tennessee State University, 1978), p. 3.

<sup>21</sup>Norma Banas and I. H. Wills, Identifying Early Learning Ga-ps (Atlanta: Humanics Press, 1975), p. 53.

<sup>22</sup>Bush and Giles, p. 117.

<sup>23</sup>Bush and Giles, pp. 122-24.

<sup>24</sup>Bush and Giles, p. 31.

Techniques associated with auditory reception are: understanding stories read orally, understanding and following verbal descriptions, and identifying familiar sounds.<sup>25</sup>

#### Diagnostic Psycho- educational Test

A diagnostic psychoeducational test

assesses specific abilities and achievements of a child in such a way that remediation of defects can logically follow. It attempts to identify the various processes used in academic skills and the various psychological functions involved in the processes of thinking, talking, perceiving, etc.<sup>26</sup>

#### Grammatic and Auditory Closure

Grammatic closure and auditory closure (auditory-vocal automatic) refer to

the ability to predict future linguistic events from past experience. This processing skill involves the acquisition of automatic habits of handling syntax and grammatic inflections.<sup>27</sup>

Techniques associated with grammatic and auditory closure are: blending sounds; learning names; understanding inherent relationships between words (beginning sounds, ending sounds, rhyming words, same and different words); and recognizing

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<sup>25</sup>Bush and Giles, pp. 39-41.

<sup>26</sup>John N. Paraskevopoulos and Samuel A. Kirk, The Development and Psychometric Characteristics of the Revised Illinois Test of Psycholinguistic Abilities (Urbana: University of Illinois Press, 1969), p. 5.

<sup>27</sup>Bush and Giles, p. 91.

correct forms of words (singular and plural, tenses).<sup>28</sup>

### Illinois Test of Psycholinguistic Abilities

The Illinois Test of Psycholinguistic Abilities "tests for specific functions that give clues to remediation."<sup>29</sup>

The test incorporates auditory-vocal and visual-motor functions as "being the most educationally relevant channels."<sup>30</sup>

### Manual Expression

Manual expression, or motor encoding, refers to the ability to express ideas in meaningful gestures. A child with a manual expression problem will have difficulty demonstrating concrete activities and concepts before others.<sup>31</sup>

Techniques related to manual expression are: imitation, marching, chalkboard drawings, demonstrations, motor activities, and games.<sup>32</sup>

### Perception

Perception refers to

the cognitive ability of the individual to both recognize and integrate external stimuli. It is a process which essentially occurs in the brain. Perception is a learned skill, which implies it

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<sup>28</sup>Bush and Giles, pp. 92-100.

<sup>29</sup>Paraskevopoulos and Kirk, p. 5.

<sup>30</sup>Paraskevopoulos and Kirk, p. 12.

<sup>31</sup>Bush and Giles, p. 295.

<sup>32</sup>Bush and Giles, pp. 296-98.

can be taught. Perceptual data actually serve as a basis for behavior.<sup>33</sup>

### Psycholinguistic Processes

There are

three main processes involved in the acquisition and use of language: (a) the receptive process, that is, the ability involved in recognizing and/or understanding what is seen or heard; (b) the expressive process, that is, those skills necessary to express ideas either vocally or by gesture or movement; (c) an organizing process which involves the internal manipulation of percepts, concepts, and linguistic symbols.<sup>34</sup>

### Psycholinguistics

Psycholinguistics is

the discipline concerned with the study of the relations between communications or messages and the cognitive or emotional states of the persons who communicate; specifically, the study of language as related to the general or individual characteristics of the users of language, with emphasis upon underlying causes of language behavior and its effects on other activities of the person.<sup>35</sup>

Psycholinguistics denotes

processes which underlie the acquisition and use of language. It is specifically identified with the ways and means that language is acquired, stored, integrated and retrieved.<sup>36</sup>

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<sup>33</sup>Wallace and McLoughlin, p. 82.

<sup>34</sup>Paraskevopoulos and Kirk, p. 12.

<sup>35</sup>Carter V. Good, ed., Dictionary of Education (3d ed.; New York: McGraw-Hill, 1973), pp. 456-57.

<sup>36</sup>Bush and Giles, p. 6.

### Verbal Expression

Verbal expression, or vocal encoding, refers to "the ability of a child/youth to express ideas in spoken language."<sup>37</sup> Techniques associated with verbal expression are: describing objects or pictures, speaking in sentences, giving directions, children teaching other children, telling stories and riddles, telling how and why, discussions, and dramatic plays.<sup>38</sup>

### Visual Association

Visual association refers to "the ability to associate visual symbols in a meaningful way; thus it deals with the visual process of interpreting relationships."<sup>39</sup> Techniques associated with visual association are: visual relationships (things that go together, picture shape puzzles, differences and likenesses) and visual classifications (classifying pictures visually, perceiving relationships, recognizing incongruities).<sup>40</sup>

### Visual Closure

Visual closure ability is "the ability to make perceptual interpretation of any visual object when only a part of it

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<sup>37</sup>Bush and Giles, p. 265.

<sup>38</sup>Bush and Giles, pp. 275-77.

<sup>39</sup>Bush and Giles, p. 177.

<sup>40</sup>Bush and Giles, pp. 180-84.

is shown."<sup>41</sup> Techniques used with visual closure are: identifying incomplete representatives of familiar objects; identifying pictures with objects hidden in them; identifying forms by noting discrepancies between the model and nearly identical, but incomplete form; and finding the missing parts.<sup>42</sup>

### Visual Memory

Visual memory refers to "the ability to remember objects, events, or words seen."<sup>43</sup> Techniques associated with visual memory are: action-memory games, use of pencil and crayon, use of letters and numbers, and visual motor activities.<sup>44</sup>

### Visual Reception

Visual reception, or visual decoding, refers to "the ability of the child to understand or interpret what is seen, that is, the ability to comprehend the meaning of symbols, written words, or pictures."<sup>45</sup> Techniques associated with visual reception are: identifying objects and pictures; and identifying colors, letters, numbers, and geometric forms.<sup>46</sup>

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<sup>41</sup>Wilma Jo Bush and Marian T. Giles, Aids to Psycholinguistic Teaching (Columbus, Ohio: Charles E. Merrill, 1977), p. 203.

<sup>42</sup>Bush and Giles, pp. 204-7.

<sup>43</sup>Bush and Giles, p. 217.

<sup>44</sup>Bush and Giles, pp. 222-25.

<sup>45</sup>Bush and Giles, p. 149.

<sup>46</sup>Bush and Giles, pp. 158-59.

### Significance of the Study

The mandated rights of children as stated in Public Law 94-142 required the delineation and remediation of deficits in academic achievement. The amelioration of psycholinguistic deficiencies through the selection of appropriate instructional aids assisted elementary supervisors and educators in future program planning.

Classroom teachers ultimately were accountable and responsible for the identification of children with academic deficiencies. The identification of psycholinguistic deficits early in a child's educational program was essential so that problems were corrected "before they became learned incorrect patterns leading to undesirable solutions,"<sup>47</sup> and before unrealistic and damaging demands were placed upon the child.

Research into the background of learning deficiencies among early elementary children revealed additional implications for a study of psycholinguistic instructional aids. The development and implementation of a program of selected psycholinguistic aids for the remediation of learning deficiencies would: (a) provide continuity of learning for students; (b) allow students the opportunity to remain at the appropriate grade level; (c) provide appropriate educational intervention; and (d) prevent loss of self-image/self-worth.

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<sup>47</sup>Wineva Grzynkowicz, "A Critical Study of Methods of Teaching Children with Learning Disabilities" (Ed.D. dissertation, Marquette University, 1969), p. 137.



The information compiled in the study assisted educators, supervisors, and regular classroom teachers in meeting the responsibilities of selecting appropriate psycholinguistic instructional aids for the remediation of learning deficiencies among early elementary children.

### Method of the Study

A review of available research was made to substantiate a need for the use of psycholinguistic instructional aids in remediation of learning deficiencies among early elementary children. Research surveyed included:

1. Auditory perception skills
2. Language skills
3. Motor skills
4. Visual perception skills.

The population of the study consisted of students enrolled during 1980-1981 in the early elementary grade levels (first, second, and third grade enrollees) of the University School, East Tennessee State University, Johnson City, Tennessee.

A stratified random sample was drawn from the population. Sample selection and assignment were achieved by limiting the number drawn from each of the three grade levels to twelve, six males and six females.

The Illinois Test of Psycholinguistic Abilities was administered to the sample. The test results were recorded,

noting psycholinguistic deficiencies for the subjects in the sample.

The stratified sample from each of the three grade levels was divided randomly into two groups containing an equal number of males and females. These groups were identified as the control groups and the experimental groups. The control groups and the experimental groups contained three males and three females from each of the three respective grade levels.

A series of reading lesson plans was developed and taught for an instructional period of twenty-one sessions to both the control groups and experimental groups by regularly assigned teachers. These plans emphasized vocabulary development, word analysis, and reading comprehension, drawn from appropriate graded readers. Behavioral objectives, appropriate activities, and evaluation components were included for each lesson taught.

The experimental groups were provided prescribed psycholinguistic instructional aids selected to remediate specifically noted deficiencies following the presentation of each lesson. The control groups received "pseudo" treatment designed to control for Hawthorne effect, which might have been present. The Illinois Test of Psycholinguistic Abilities was re-administered to both the experimental groups and the control groups upon completion of the instructional period. The null form for each of the research hypotheses was tested.

The statistical technique used to analyze and interpret the data was the analysis of covariance. The covariate used was the pretest. W. James Popham and Kenneth A. Sirotnik stated that the analysis of covariance was an extremely valuable statistical technique because it allowed the researcher to test "for mean differences between two or more groups" while at the same time it "compensated for initial differences between the groups."<sup>48</sup> The authors explained that the compensation led to an increased precision of the statistical test.<sup>49</sup> The level of significance used in the study was 0.05. Data were processed through the East Tennessee State University Computer Center.

### Research Hypotheses

The following research hypotheses were formulated:

H1: A significant gain exists between the scores achieved on the Illinois Test of Psycholinguistic Abilities by the experimental group in grade level one over the scores achieved on the Illinois Test of Psycholinguistic Abilities by the control group in grade level one.

H2: A significant gain exists between the scores achieved on the Illinois Test of Psycholinguistic Abilities by the experimental group in grade level two over the scores

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<sup>48</sup>W. James Popham and Kenneth A. Sirotnik, Educational Statistics: Use and Interpretation (New York: Harper and Row, 1973), p. 212.

<sup>49</sup>Popham and Sirotnik, p. 212.

achieved on the Illinois Test of Psycholinguistic Abilities by the control group in grade level two.

H3: A significant gain exists between the scores achieved on the Illinois Test of Psycholinguistic Abilities by the experimental group in grade level three over the scores achieved on the Illinois Test of Psycholinguistic Abilities by the control group in grade level three.

H4: A significant gain exists between the scores achieved on the Illinois Test of Psycholinguistic Abilities by the composite experimental group from all grade levels over the scores achieved on the Illinois Test of Psycholinguistic Abilities by the composite control group from all grade levels.

### Organization of the Study

The study was organized into five chapters. Chapter 1 contains an introduction to the study, a statement of the problem, limitations of the study, assumptions, definitions of terms, significance of the study, method of the study, research hypotheses, and organization of the study.

Chapter 2 presents a review of related literature.

Chapter 3 presents the design of the study. It includes the population and sample, procedures, instrumentation, student tasks, personnel required, space needed, equipment, and budget considerations.

Chapter 4 includes the presentation and analysis of data.

Chapter 5 presents the summary of the research, including the findings, conclusions, and recommendations of the study.

The dissertation concludes with appendices, containing pertinent reference materials, and a bibliography of sources cited.

## Chapter 2

### REVIEW OF RELATED LITERATURE

#### Introduction

The review of related literature is an overview of psycholinguistic elements authorities indicated as those which affected learning among early elementary children. The psycholinguistic components which appeared frequently in the literature included auditory perception skills, language skills, motor skills, and visual perception skills. The key features found in the Illinois Test of Psycholinguistic Abilities: auditory reception, visual reception, auditory association, visual association, verbal expression, manual expression, grammatic closure, auditory sequential memory, visual sequential memory, auditory closure, and sound blendings, were evident in the review of literature. Books, periodicals, multivolume works and series, government documents, theses, and dissertations relevant to the study were searched.

#### Auditory Perception Skills

Wineva Grzynkiewicz listed in her dissertation, "A Critical Study of Methods of Teaching Children with Learning Disabilities," various definitions of auditory perception.<sup>1</sup> She

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<sup>1</sup>Wineva Grzynkiewicz, "A Critical Study of Methods of Teaching Children with Learning Disabilities" (Ed.D. dissertation, Marquette University, 1969), p. 108.

reported that some authors referred to the entire receptive process as perception while others distinguished between perception and sensation.<sup>2</sup> Janet W. Lerner, in 1971, reported that auditory perception was the organization of sensory data received through the ear.<sup>3</sup> Dorothy Seymour, in 1970, had difficulty differentiating between auditory perception and auditory discrimination.<sup>4</sup> E. Schwalb, H. Blau, and H. Blau equated the two processes.<sup>5</sup>

The definition of J. C. Chalfant and M. A. Scheffelin seemed to be most appropriate for the purpose of this study. These researchers referred to auditory perception as the "central processing of auditory stimuli."<sup>6</sup>

Doris J. Johnson and Helmer R. Myklebust listed the following auditory integrities essential to the acquisition of reading: ability to distinguish similarities and differences in sounds, ability to perceive a sound within a word, ability to synthesize sounds into words, and the

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<sup>2</sup>Grzynkiewicz, p. 108.

<sup>3</sup>Janet W. Lerner, Children with Learning Disabilities (Boston: Houghton Mifflin, 1971), p. 50.

<sup>4</sup>Dorothy Seymour, "What Do You Mean, 'Auditory Perception'?" Elementary School Journal, LXX (January, 1970), 179.

<sup>5</sup>E. Schwalb, H. Blau, and H. Blau, "Child with Brain Dysfunction," Journal of Learning Disabilities, II (April, 1969), 188.

<sup>6</sup>J. C. Chalfant and M. A. Scheffelin, Central Processing Dysfunctions in Children: A Review of Research. NINDS Monograph, No. 9 (Bethesda, Maryland: U.S. Department of Health, Education and Welfare, 1969), p. 9.

ability to divide them into syllables.<sup>7</sup>

Wallace and McLoughlin warned of the importance to differentiate auditory perception from auditory acuity. They stated that auditory acuity was an individual's ability to receive sounds physiologically, while auditory perception was a cognitive skill.<sup>8</sup>

Katrina DeHirsch, in apparent agreement with Wallace and McLoughlin, stated that children who had difficulty decoding and encoding verbal symbols exhibited verbal disturbances. She noted that such children "do not pay attention to information feed through auditory pathway; they hear but do not understand."<sup>9</sup> Johnson and Myklebust stated that the child with a generalized deficit in auditory learning hears but does not interpret what he hears.<sup>10</sup>

William M. Cruickshank reported that it was possible for a child to achieve a perfect audiogram in a pure-tone audiometer test and not be able to understand speech. The author stated that

there are no complex patterns of sounds in the test for him to analyze; there is no background

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<sup>7</sup>Doris J. Johnson and Helmer R. Myklebust, Learning Disabilities: Educational Principles and Practices (New York: Grune and Stratton, 1967), p. 173.

<sup>8</sup>Gerald Wallace and James A. McLoughlin, Learning Disabilities (Columbus, Ohio: Charles E. Merrill, 1975), p. 88.

<sup>9</sup>Katrina DeHirsch and William S. Lanford, Predicting Reading Failure (Evanston, Illinois: Harper and Row, 1966), p. xi.

<sup>10</sup>Johnson and Myklebust, p. 67.



noise to attract his attention. The child has ears that hear, but he has not learned to attach association to the sounds of speech he hears.<sup>11</sup>

Bill R. Gearheart and Mel W. Weishahn reported that children with auditory perceptual difficulties were not able to perceive various consonant blends or differentiate the ring of the front door from the ring of the telephone. The children described by Gearheart and Weishahn at first seemed to have a lack of sensory acuity. Careful examination proved such children to have auditory perception problems.<sup>12</sup>

The importance of auditory perception abilities to learning was stressed in the literature. Robert Dykstra reported the results of a study which examined the relationships between pre-reading measures of auditory discrimination and reading achievement at the end of first grade. He concluded that the ability to make auditory discriminations contributed to success in learning to read and that learning to read was an extremely complex task.<sup>13</sup> The importance of auditory blendings and auditory memory was stressed by Nancy E. Golden and Sharon R. Steiner.<sup>14</sup> Gerald Wallace and James

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<sup>11</sup>William M. Cruickshank and others, A Teaching Method for Brain-Injured and Hyperactive Children (Syracuse: Syracuse University Press, 1961), p. 143.

<sup>12</sup>Bill R. Gearheart and Mel W. Weishahn, The Handicapped Child in the Regular Classroom (St. Louis: C. V. Mosby, 1976), p. 116.

<sup>13</sup>Robert Dykstra, "Auditory Discrimination Abilities and Beginning Reading Achievement," Reading Research Quarterly, I (Spring, 1966), 32.

<sup>14</sup>Nancy E. Golden and Sharon R. Steiner, "Auditory and Visual Functions in Good and Poor Readers," Journal of Learning Disabilities, II (September, 1969), 480.

M. Kauffman reported that children with auditory skill deficiencies have difficulties in differentiating, synthesizing, and remembering the sounds represented by different letters. The authors stressed that the child must learn to:

1. Discriminate among sounds,
2. Discriminate initial and final letter sounds,
3. Synthesize letters sounds into words,
4. Remember the sounds of letters and words.<sup>15</sup>

Other studies, such as that of Joseph M. Wepman, provided evidence of the importance of the role of auditory perception.<sup>16</sup>

David D. Dukes, in 1978, concluded from his study of 120 children in grades one through three that auditory discrimination did not "seem to be generally significantly related to sight vocabulary, hearing sounds in words or listening comprehension."<sup>17</sup> He felt that although strong positive relationships did not appear to exist, diagnosis and evaluation were essential because difficulty in auditory discrimination was not ruled "out as a contributing cause of inability to read efficiently."<sup>18</sup>

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<sup>15</sup>Gerald Wallace and James M. Kauffman, Teaching Children with Learning Problems (Columbus, Ohio: Charles E. Merrill, 1978), p. 184.

<sup>16</sup>Joseph M. Wepman, "Auditory Discrimination, Speech and Reading," Elementary School Journal, LX (March, 1960), 325-33.

<sup>17</sup>David D. Dukes, "A Study Comparing Measures of Auditory Discrimination to Other Measures Relative to Reading Achievement" (M.A. thesis, East Tennessee State University, 1978), p. 47.

<sup>18</sup>Dukes, p. 47.

Diane J. Newman German found in her study that children with learning disabilities manifested significant word-finding errors.<sup>19</sup> The children also manifested errors in the naming of open-ended sentences and naming description conditions. German suggested that vocabulary selection for word-finding evaluations was critical. An important generalization formed from the investigation was that auditory conditions were more challenging to the retrieval process of the children with learning difficulties than the traditional picture-naming contexts.<sup>20</sup>

Wilma Jo Bush, in Aids to Psycholinguistic Teaching, stressed that the auditory channel was one of the most important avenues through which children learned about their environment.<sup>21</sup> She reported that the "qualitative aspects of speaking and the understanding of meaning of sounds" were dependent upon the sensory channel. Bush stated that educators, as they planned developmental or remedial instructional lessons, had to consider the auditory channel.<sup>22</sup>

Wendy Marlowe, Karl Egner, and Denyse Foreman conducted

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<sup>19</sup>Diane J. Newman German, "Word-Finding Skills in Children with Learning Disabilities," Journal of Learning Disabilities, XII (March, 1979), 46.

<sup>20</sup>German, pp. 47-48.

<sup>21</sup>Wilma Jo Bush and Marian T. Giles, Aids to Psycholinguistic Teaching (Columbus, Ohio: Charles E. Merrill, 1977), p. 27.

<sup>22</sup>Bush and Giles, p. 27.

a study in which normal and disabled readers (i.e., children with word recognition difficulties) were compared for reading and listening comprehension of the same story. "The reading disabled group showed marked improvement under the auditory condition: its performance was identical to that of the normal group."<sup>23</sup> The reading disabled group given the visual presentation answered fewer factual and inferential questions correctly than those who heard the story or than the normal readers under either presentation, according to the authors. Marlowe, Egner, and Foreman reported no differences between the groups on vocabulary questions.<sup>24</sup>

The reading disabled group who heard the story were equally competent at acquiring facts and using them for inference building. This is consistent with the adequacy of their auditory language and thinking skills. In contrast, the disabled readers who were required to learn by reading were unable to acquire facts and inferences. Thus, the visual decoding process interfered with learning and manipulating information in this group.<sup>25</sup>

Etta Miller reported that two methods were popular for teaching word-recognition.<sup>26</sup> Children were taught in one method to recognize words as wholes. Symbol-sound associations

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<sup>23</sup>Wendy Marlowe, Karl Egner, and Denyse Foreman, "Story Comprehension as a Function of Modality and Reading Ability," Journal of Learning Disabilities, XII (March, 1979), 62.

<sup>24</sup>Marlowe, Egner, and Foreman, p. 63.

<sup>25</sup>Marlowe, Egner, and Foreman, p. 63.

<sup>26</sup>Etta Miller, "First-Grade Reading Instruction and Modality Preference," Elementary School Journal, LXXX (November, 1979), 99.

were taught to the children in the other method which allowed students to sound out words. The author stated that reading involved auditory as well as visual abilities. A phonics program demanded auditory skills requiring the learner to use auditory discrimination, closure, and memory. The student isolated parts of words, recalled and applied the correct phonic generalization, and, finally, blended the parts to form the word, according to Miller. The whole-word approach, in contrast, required visual skills to remember isolated words in the text. Miller found that in both methods some children learned to read, but others failed.<sup>27</sup>

Marianne Frostig and Phyllis Maslow pointed out the importance of auditory-figure-ground association, as this skill referred to the ability of children to select and attend to relevant stimuli. Children with deficits in auditory-figure-ground association were unable to screen out distracting stimuli.<sup>28</sup>

The ability to associate spoken words in a meaningful way involved the auditory process of interpreting relationships, according to Bush. She held the opinion that the skill could be developed through the use of concrete, functional, or abstract similarities.<sup>29</sup>

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<sup>27</sup>Miller, p. 99.

<sup>28</sup>Marianne Frostig and Phyllis Maslow, Learning Problems in the Classroom (New York: Grune and Stratton, 1973), p. 205.

<sup>29</sup>Bush and Giles, p. 67.

Patricia H. Gillespie and Lowell Johnson, in 1974, investigated the importance of auditory discrimination in reading achievement. The similarities and differences between and among sounds were referred to as auditory discrimination.<sup>30</sup>

The significance of auditory memory was studied by Golden and Steiner. These researchers found "sequential memory to be a significant skill in the mastery of the reading process."<sup>31</sup>

Memory deficits seriously affected the learning process, according to Gearheart and Weishahn. These authors reported cases of children who could not repeat "a simple sequence of three words immediately after hearing them."<sup>32</sup>

John McLeod concluded from his study that good spellers appeared to have superior sequencing ability to poor spellers. He believed that the term "sequencing ability" had to be interpreted in a more sophisticated manner than has generally been the case. McLeod defined the sequential ability of good spellers as the "internalization of the redundancy stimuli that have been repeatedly associated sequentially."<sup>33</sup>

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<sup>30</sup>Patricia H. Gillespie and Lowell E. Johnson, Teaching Reading to the Mildly Retarded Child (Columbus, Ohio: Charles E. Merrill, 1974), p. 65.

<sup>31</sup>Nancy E. Golden and Sharon R. Steiner, "Auditory and Visual Functions in Good and Poor Readers," Journal of Learning Disabilities, II (September, 1969), 477.

<sup>32</sup>Bill R. Gearheart and Mel W. Weishahn, The Handicapped Child in the Regular Classroom (St. Louis: C. V. Mosby, 1976), p. 116.

<sup>33</sup>John McLeod, "The Importance of Sequencing as an Aspect of Short-term Memory in Good and Poor Spellers," Journal of Learning Disabilities, XIII (May, 1980), 33.

McLeod reported that poor spellers had inferior gross memory but did not show specific deficiency in ability to order their responses. He concluded that "one cannot be expected to repeat five digits in correct sequence if one's gross memory extends only to four digits."<sup>34</sup>

Bush and Giles reported that some children "cannot attend, thus cannot respond, because they are not aware of what they hear." Still other children "cannot remember because they find it difficult to retrieve information of which they have been aware."<sup>35</sup> The authors stated that memory was an important aspect of the learning process because following directions and communicating knowledge was a necessity in academic endeavors.<sup>36</sup>

Walter H. Reeves pointed out in his study concerned with auditory learning disabilities in April, 1980, that children with such problems tend to be inattentive and have difficulty understanding language input and grasping language concepts.<sup>37</sup> The author stated that the children often had problems with auditory recall, sometimes gave seemingly irrelevant responses to questions, or interjected comments that were not relevant.

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<sup>34</sup>McLeod, p. 36.

<sup>35</sup>Bush and Giles, p. 117.

<sup>36</sup>Bush and Giles, p. 118.

<sup>37</sup>Walter H. Reeves, "Auditory Learning Disabilities and Emotional Disturbance: Diagnostic Differences," Journal of Learning Disabilities, XIII (April, 1980), 30.

Often children with auditory disabilities had difficulty in generating or formulating expressive language responses.<sup>38</sup>

Reeves concluded from his research that school children with auditory learning disabilities who were conversationally facile were able to abstract and symbolize on the basis of visual, nonverbal input at a level commensurate with normal learners. He suggested that instructionally it seemed feasible to build or strengthen conceptual abilities via the visual modality.<sup>39</sup>

Kirk and Kirk noted the importance of auditory blending. The authors stated that children who experienced difficulty in auditory blending were able to differentiate individual sounds in isolation, but were unable to blend sounds to form a complete word.<sup>40</sup>

The acquisition of automatic habits of handling syntax and grammatic inflections was called a processing skill by Bush and Giles. The two researchers reported auditory sound blending was a closure function related to the ability to predict future linguistic events from past experience.<sup>41</sup>

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<sup>38</sup>Reeves, p. 30.

<sup>39</sup>Reeves, p. 33.

<sup>40</sup>Samuel A. Kirk and Winifred D. Kirk, Psycholinguistic Learning Disabilities: Diagnosis and Remediation (Urbana: University of Illinois Press, 1972), p. 111.

<sup>41</sup>Wilma Jo Bush and Marian T. Giles, Aids to Psycholinguistic Teaching (Columbus, Ohio: Charles E. Merrill, 1977), pp. 91-92.



### Language Skills

Gearheart and Weishahn reported that although little was known about how language originated in the human race or how children learned to vocalize needs or desires in order to communicate with others, it was known that speech and language were learned behaviors. The authors stated that similarities existed between more than a thousand languages yet there were highly significant differences. There seemed to be little logic as to why different races had specific language patterns. Observation, according to Gearheart and Weishahn, has shown that children learned the language spoken around them to communicate needs and desires.<sup>42</sup> Kenneth S. Goodman stated that reading was a language art and the teaching of reading "must be based on the best available knowledge of language."<sup>43</sup>

Children perceived very early the aspects of the world around them, according to Benjamin S. Bloom, Allison Davis, and Robert Hess. Sensory modalities such as vision, hearing, touch, taste, and smell aided in perceptual development. Perceptual development continued as children approached and entered the beginning of formal education.<sup>44</sup>

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<sup>42</sup>Gearheart and Weishahn, p. 94.

<sup>43</sup>Kenneth S. Goodman, "The Linguistics of Reading," Elementary School Journal, LXIV (April, 1964), 355.

<sup>44</sup>Benjamin S. Bloom, Allison Davis, and Robert Hess, Compensatory Education for Cultural Deprivation (New York: Holt, Rinehart and Winston, 1965), p. 13.

Linguistic development was closely connected to perceptual development, according to Bloom, Davis, and Hess. They stated that

as the child comes to perceive the world about him, he is able to "fix" or hold particular objects and events in his mind as he is given words or other symbols to "attach" to them.<sup>45</sup>

The authors further reported that

as a child develops more complex language, he becomes more able to perceive aspects of his environment, to abstract such aspects and to fix them in his memory, and to gain control over his environment through the use of language. The frequent use of language enables the child to use words and language as tools of thought.<sup>46</sup>

Jean Aitchison in her book, The Articulate Mammal, pointed out the mysterious nature of human language. She stressed that although computers could play chess, sort bank statements, and even talk about limited topics, manufacturers were far from producing a "great automatic grammatizator" which could hold a conversation on any topic.<sup>47</sup>

B. F. Skinner wrote, in Verbal Behavior, that human learning took place by means of "trial-and-error" learning or operant learning. He suggested that even language learning developed by means of this mechanism.<sup>48</sup>

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<sup>45</sup>Bloom, Davis, and Hess, p. 13.

<sup>46</sup>Bloom, Davis, and Hess, p. 13.

<sup>47</sup>Jean Aitchison, The Articulate Mammal: An Introduction to Psycholinguistics (New York: Universe Books, 1977), pp. 17-18.

<sup>48</sup>B. F. Skinner, Verbal Behavior (New York: Appleton-Century-Crofts, 1957), p. 3.

Noam Chomsky wrote a critical review of Verbal Behavior. Chomsky made two major criticisms of Skinner's book: that the behavior of rats in boxes was irrelevant to human language, and that Skinner misunderstood the nature of language.<sup>49</sup> Chomsky concluded by stating that children made hypotheses about the rules which underlay the speech they heard.<sup>50</sup>

Wallace and McLoughlin reported that concrete words such as table, man, and chair were easier to learn by children with language problems than more abstract words such as with, the, and who. They stressed that children needed in-depth experience to understand the latter.<sup>51</sup>

Word meaning must be acquired before words can be used as words, according to Doris J. Johnson and Helmer R. Myklebust. This intriguing aspect of language development was referred to as inner language by the authors. They stressed that inner language processes permitted the transformation of experience into symbols, either verbal or nonverbal.<sup>52</sup> Johnson and Myklebust pointed out that a child with a disorder

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<sup>49</sup>Noam Chomsky, "Review of Skinner's Verbal Behavior," Language, XXXV (March, 1959), 28.

<sup>50</sup>Chomsky, p. 38.

<sup>51</sup>Gerald Wallace and James A. McLoughlin, Learning Disabilities (Columbus, Ohio: Charles E. Merrill, 1975), p. 135.

<sup>52</sup>Doris J. Johnson and Helmer R. Myklebust, Learning Disabilities: Educational Principles and Practices (New York: Grune and Stratton, 1967), p. 36.

of inner language may have difficulty in acquiring meaning itself or he/she may have a deficiency in ability to transform experience into symbols.<sup>53</sup>

Children had to learn how words were grouped to form phrases, sentences, paragraphs, and other meaningful units, according to Wallace and McLoughlin. Many words were learned in isolation; thus children with language deficits were confused when they were used with other words in a sentence.<sup>54</sup>

Wallace and McLoughlin noted that following directions was closely related to understanding words and sentences. Often children deficient in this skill were "bombarded with too much language" and they "could not relate what they heard to the subsequent motor or cognitive skills necessary to complete the directions."<sup>55</sup> Wallace and McLoughlin provided the following examples of problems encountered in this area:

One boy did not understand the word "outline," so he was unable to complete the directions "to outline all the circles" on a worksheet. Another child could not "take a left at the next corridor" because he had not mastered the left-right discrimination.<sup>56</sup>

Johnson and Myklebust suggested the following broadly conceived approaches to language development: the development of receptive before expressive language, the development of

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<sup>53</sup>Johnson and Myklebust, p. 37.

<sup>54</sup>Wallace and McLoughlin, p. 135.

<sup>55</sup>Wallace and McLoughlin, p. 136.

<sup>56</sup>Wallace and McLoughlin, p. 136.

auditory before visual skills, progression from concrete to abstract language, and finally, development from simple to more complex verbalizations.<sup>57</sup>

### Motor Skills

Coordination difficulties, according to Laura E. Lehtinen, become evident in learning to write or playing in the gym or on the playground where complex and integrated motor and perceptual demands were made. These skills often were not detectable in a child's walking or running.<sup>58</sup>

The following description of a young child with a motor skill deficiency was related by Wallace and McLoughlin:

B. J. is a thin, clumsy girl attending kindergarten at a private school. The kindergarten teacher reported that B. J. had above-average language skills. She also reported on the other hand, that B. J. was noticeably inferior on many tasks requiring fine and gross motor skills. Her inability to perform various finger plays (e.g., "The Eensy Weensy Spider"), make simple geometric designs which she could easily differentiate, or use a pair of scissors were all observed and reported.<sup>59</sup>

Newell C. Kephart stressed the importance of motor movements. He pointed out that the child's first interactions with his/her environment were motor. A child's first learnings

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<sup>57</sup>Johnson and Myklebust, p. 104.

<sup>58</sup>Laura E. Lehtinen, Have You Ever Known a Perceptually Handicapped Child? (Evanston, Illinois: Fund for Perceptually Handicapped Children, Inc., 1965), p. 3.

<sup>59</sup>Wallace and McLoughlin, p. 103.

were motor learnings. The child attempted to organize the environment by means of motor interactions. Kephart stated that many learning difficulties began at the early developmental motor stage.<sup>60</sup>

Robert M. Smith and John T. Neisworth listed in their book, The Exceptional Child: A Functional Approach, the following outline of theories concerning perceptual motor development:

- Prominent Theories of Perceptual-Motor Development
- I. Kephart's perceptual-motor theory (1967).
    - A. This theory states that normal perceptual-motor development is necessary so that the child can build concepts of the world.
    - B. Four major groups of motor patterns are focused upon: locomotion, contact, balance and maintenance of posture, and receipt and propulsion.
  - II. Getman's visumotor model (1965).
    - A. This model is concerned with visual development and learning.
    - B. Each successive stage of development is dependent upon learning the previous stage.
  - III. Patterning theory of neurological organization by Doman and Delacato (Delacato, 1966).
    - A. The maturation of the individual occurs in the same developmental stages as the development of the species of the evolutionary process.
    - B. Patterning is the manipulation of a child's body into positions of the various developmental stages until neurological organization is produced.
  - IV. Barsch's movigenic theory (1967, 1968): learning related to motor skills.
  - V. Frostig's perception learning theory (Frostig and Horne, 1964).<sup>61</sup>

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<sup>60</sup>Newell C. Kephart, "Perceptual-Motor Aspects of Learning Disabilities," Exceptional Children, XXXI (December, 1964), 202.

<sup>61</sup>Robert M. Smith and John T. Neisworth, The Exceptional Child: A Functional Approach (New York: McGraw-Hill, 1975), pp. 388-89.

Activities which required the use of large muscles such as walking, running, hopping, skipping, jumping, throwing, catching, and muscular strength were described in the literature as gross motor skills. Kephart reported that gross motor skills were learned by most children before fine motor skills.<sup>62</sup>

Johnson and Myklebust suggested that children with learning deficiencies "know what they should do and have no paralysis, but they cannot relate the motor patterns they see to their motor systems."<sup>63</sup>

Wallace and McLoughlin reported that various physical exercises were difficult for children with gross motor deficits. The activities which the two researchers found to require muscular strength and gross motor ability were touching toes from a standing position, sit-ups, chin-ups, and push-ups.<sup>64</sup>

Activities which required the use of small muscles, involving eye movement and hand use, were described in the literature as fine motor skills. Kephart reported that "normal classroom activities made greater demands upon fine motor skills than upon any other activity of the child." He stressed that the finger movements and hands in coloring, copying, and

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<sup>62</sup>Kephart, p. 203.

<sup>63</sup>Johnson and Myklebust, p. 283.

<sup>64</sup>Wallace and McLoughlin, p. 116.

writing made heavy demands upon small motor skills.<sup>65</sup> Wallace and McLoughlin found that fine motor deficits were usually a devastating problem to a young child because beginning writing and initial reading skills depended upon adequate motor activity.<sup>66</sup> Frostig and Maslow stated that children with disabilities in fine motor coordination were likely to have difficulty in writing and in opening a book to a certain page.<sup>67</sup>

The relationship between reading skills and perceptual motor skills was reported by Gillespie and Johnson in 1974. The authors noted that perceptual motor deficits were found frequently in students with reading disabilities. They stressed that a causal relationship may or may not exist.<sup>68</sup>

Balance was the ability to maintain a position with minimal surface contact; children who did not have this relationship were unable to develop spatial structure, according to Wallace and McLoughlin. Balance was described in the literature as an integral part of activities such as

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<sup>65</sup>Kephart, p. 206.

<sup>66</sup>Gerald Wallace and James A. McLoughlin, Learning Disabilities (Columbus, Ohio: Charles E. Merrill, 1975), p. 116.

<sup>67</sup>Marianne Frostig and Phyllis Maslow, Learning Problems in the Classroom (New York: Grune and Stratton, 1973), p. 300.

<sup>68</sup>Patricia H. Gillespie and Lowell E. Johnson, Teaching Reading to the Mildly Retarded Child (Columbus, Ohio: Charles E. Merrill, 1974), p. 68.



walking, standing, stopping and pulling. Problems in static balances involved movements in which a child was required not to move as well as disturbances in dynamic balance movements in which a child maintained a position on a moving surface.<sup>69</sup>

It was suggested by Kephart that equilibrium was the crux of the balance problem. The balance beam was used to help a child pinpoint his center of gravity. Walking backward, forward, sideward, or hopping while holding onto something were difficult activities for some children.<sup>70</sup>

Frostig referred to rhythm as "flowing, measured, balanced movement." Children who could not perceive rhythms or produce them were described as arhythmic.<sup>71</sup>

Kephart described motor rhythm as "the ability to perform a movement or series of movements with a consistent time interval." Such activities as tapping out a pattern, marching, or performing the jumping-jack exercise were difficult for the child with rhythm deficiency, according to Kephart.<sup>72</sup> Children with problems in auditory rhythm had difficulty with such activities as dancing or playing rhythm instruments, reported Wallace and McLoughlin.<sup>73</sup>

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<sup>69</sup>Wallace and McLoughlin, p. 117.

<sup>70</sup>Kephart, p. 203.

<sup>71</sup>Marianne Frostig, Movement Education: Theory and Practice (Chicago: Follett, 1970), p. 177.

<sup>72</sup>Newell C. Kephart, The Slow Learner in the Classroom (Columbus, Ohio: Charles E. Merrill, 1971), p. 177.

<sup>73</sup>Wallace and McLoughlin, p. 118.

The complete motor awareness of the two sides of the body referred to laterality in the literature. Laterality was the internal awareness of the two sides and their differences, according to Kephart.<sup>74</sup> A. J. Harris reported that a child who had not established a preferred hand had no definite clue in deciding which side of his body was left or right. This directional confusion may interfere with the ability to read.<sup>75</sup>

Kephart described children who had not developed laterality:

When writing on the chalkboard, this child uses one hand for the writing activity while the other hand and arm are noticeably tensed or are making small movements that are mirror images of those being made by the dominant side. Such a child has no need to differentiate the sides because they always perform the same movements.<sup>76</sup>

Other disturbances of children with laterality difficulties were problems with skipping, smoothly balancing on one foot, or riding a tricycle or bicycle, according to Wallace and McLoughlin. These authors listed problems of older children as difficulty using tools with precision, knowing right and left in relation to other people, or mixing capital and lowercase letters.<sup>77</sup>

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<sup>74</sup>Kephart, The Slow Learner, p. 187.

<sup>75</sup>A. J. Harris, How to Increase Reading Ability (New York: David McKay, 1970), p. 245.

<sup>76</sup>Kephart, The Slow Learner, pp. 87-88.

<sup>77</sup>Wallace and McLoughlin, p. 118.

Directionality referred to the ability to know right from left, up from down, and forward from backward. It was the belief of Kephart that directionality depended upon laterality. He stated that if a child "established internal awareness of the distinction between his right and left sides, he was ready to transfer these concepts of direction to his external world of space."<sup>78</sup> A combination of the sum of all feeling about the body (body image), the automatic adjustments of bones and muscles necessary for posture and movement (body schema) and factual knowledge concerning the body (body concept) was defined as body awareness by Frostig.<sup>79</sup>

Wallace and McLoughlin listed the following commands and instructions as examples of confusing directions to children with inaccurate directionality:

Draw a line under the table.  
Place the book on top of the desk.  
Move backwards one step.  
Place an X on the girl.<sup>80</sup>

Consistently reversed and rotated letters suggested children with directionality disturbances. Complete word reversals were due to the child's inability to distinguish directional concepts, according to Wallace and McLoughlin.<sup>81</sup>

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<sup>78</sup>Newell C. Kephart, "Perceptual-Motor Aspects of Learning Disabilities," Exceptional Children, XXXI (December, 1964), 204.

<sup>79</sup>Frostig and Maslow, p. 162.

<sup>80</sup>Wallace and McLoughlin, p. 119.

<sup>81</sup>Wallace and McLoughlin, p. 119.

However, Gillespie and Johnson pointed out that causal relationships between directionality and reading reversals have not been completely established, even though directional confusion appears in groups of poor readers.<sup>82</sup>

Another academic area affected by directionality was handwriting. D. R. Jordon reported that directional confusion often created "erratic production, with much erasing and writing over." He found that poor letter formation and a generally messy appearance described the work of a child with directionality disturbances.<sup>83</sup>

A child developed a reliable point of origin only through a consistent body image according to Kephart. He believed that adequate body image was crucial for all motor movements.<sup>84</sup> Harris concluded that mixed handedness was related to poor reading while crossed dominance and mixed eyedness was not.<sup>85</sup>

The following description of a child with body image difficulties was reported by Kephart in The Slow Learner in the Classroom.

Such a child will display this difficulty when asked to select a space on the floor among furniture and other obstacles, which is sufficiently large to permit him to lie down and move his arms

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<sup>82</sup>Gillespie and Johnson, p. 70.

<sup>83</sup>D. R. Jordon, Dyslexia in the Classroom (Columbus, Ohio: Charles E. Merrill, 1972), p. 57.

<sup>84</sup>Kephart, "Perceptual-Motor Aspects of Learning Disabilities," p. 202.

<sup>85</sup>Harris, p. 242.

and feet freely. He will select a space that is too small and in which his arms and legs bump into the furniture when he moves them. On the other hand, he may demand more space than he needs for his movements. Either error indicates an imperfect awareness of the space occupied by his body in various positions.<sup>86</sup>

Lorraine M. Grimwood and Elizabeth M. Rutherford conducted a three-year study concerned with assessing the effectiveness of sensory integration therapy as an intervention method on a group of grade one "at risk" readers.<sup>87</sup> The children were predicted to be "at risk" for later reading failure. The experimental group performed significantly higher than the control group on measures of reading ability following therapy sessions of two half-hours per week over twenty-four weeks. "The gains were maintained over a two-year non-intervention period."<sup>88</sup>

The philosophical foundations for training the sensory-motor skills were described in Grzynkiewicz's study.<sup>89</sup> John Amos Comenius (1592-1670) urged the teacher to appeal to the child's sensory perception. He stressed that teaching materials be based upon the child's own experience.<sup>90</sup> Comenius

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<sup>86</sup>Kephart, The Slow Learner, p. 95.

<sup>87</sup>Lorraine M. Grimwood and Elizabeth M. Rutherford, "Sensory Integration Therapy as an Intervention Procedure with Grade One 'At Risk' Readers--A Three Year Study," Exceptional Children, XLI (March, 1980), 52.

<sup>88</sup>Grimwood and Rutherford, p. 52.

<sup>89</sup>Wineva Grzynkiewicz, "A Critical Study of Methods of Teaching Children with Learning Disabilities" (Ed.D. dissertation, Marquette University, 1969), p. 15.

<sup>90</sup>Grzynkiewicz, p. 16.

stated in the preface of Orbis Pictus his philosophical principle.

There is nothing in the intellect that has not first existed in the senses. It is because schools normally neglect this truth, and give the pupils things to learn that they do not understand and which have not been properly placed before their organs of sense-perception that the tasks of the teacher and the learner are so irksome, and little result is produced.<sup>91</sup>

Comenius' view of the importance of sense training was expressed as follows:

The sense of hearing should always be cojoined with that of sight, and the tongue should be trained in combination with the hand. The subjects that are taught should not merely be taught orally, and thus appeal to the ear alone, but should be pictorially illustrated, and thus develop the imagination by the help of the eye. Again, the pupils should learn to speak with their mouths and at the same time express what they say with their hands, that no study may be proceeded with before what has already been learned is thoroughly impressed on the eyes, the ears, the understanding, and the memory. With this object, it is desirable to represent pictorially, on the walls of the classroom, everything that is treated in the class, by putting up either precepts and rules or pictures and diagrams illustrative of the subjects taught.<sup>92</sup>

John Locke (1632-1704) was the first to change the attention of educators from training the "faculties" to training senses. Locke considered each student a patient who needed specific help and the human mind was a blank sheet of paper, the tabula rasa, upon which experiences engraved

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<sup>91</sup>M. W. Keatinge, The Great Didactic of John Amos Comenius, Part I (London: A. and C. Black, Ltd., 1921), p. 76.

<sup>92</sup>M. W. Keatinge, The Great Didactic of John Amos Comenius, Part II (London: A. and C. Black, Ltd., 1921), p. 139.

knowledge. He stressed that perceptions were the result of an accumulation of previous sensations and that they involved thinking, doubting, believing, reasoning, and knowing.<sup>93</sup>

The importance of readiness for learning was emphasized by Locke when he said the following about a student, "'Tis better it be a year later before he can read than he should this way get an aversion to learning."<sup>94</sup>

Locke's concept of individuality was enlarged by Jean-Jacques Rousseau (1712-1778) who postulated states of mental growth and the adjustment of education to children. He taught that the intellect was developed in childhood through the senses.<sup>95</sup> A vocal champion of the rights of children, Rousseau appealed to the reader in his preface to Emile to "learn more about children and not to consider them as miniature adults."<sup>96</sup>

Johann Heinrich Pestalozzi (1747-1827), influenced by Rousseau, insisted that learning occurred in life situations. He prescribed steps for children to learn by doing. The Anschauung or object lesson was used so that children learned

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<sup>93</sup>Grzynekowicz, p. 19.

<sup>94</sup>John William Adamson, ed., The Educational Writings of John Locke (New York: Longmans Green and Co., 1912), p. 119.

<sup>95</sup>Grzynekowicz, p. 22.

<sup>96</sup>William Boyd, trans., The Emile of Jean-Jacques Rousseau (Columbia, New York: Teachers College Press, 1967), p. 5.

by seeing, hearing, and tasting.<sup>97</sup> Pestalozzi's principles of education were that (1) all learning derived from sense impressions and (2) instruction moved from the simple to the complex.<sup>98</sup> Pestalozzi's description of the method to teach arithmetic stressed understanding before memorization.

For instance, when he asked in arithmetic, "how many times is seven contained in sixty-three?" the child had no real background for his answers, and must with great trouble dig it out of his memory. Now, by the plan of putting nine times seven objects before his eyes, and letting him count them as nine sevens together, he has not to think any more about this question; he knows from what he has already learnt, although he is asked for the first time, that seven is contained nine times in sixty-three. So is this in other departments of the method.<sup>99</sup>

Sensory training investigators mentioned the works of Jean Marc Itard (1775-1838) and his experiments with Victor, a young boy of eleven or twelve who was found living wild in the woods. Itard added much to educational methods even though Victor became unmanageable and finally was placed in an institution.<sup>100</sup> Many of Itard's ideas, according to Grzynekowicz, developed into a much needed multi-disciplinary

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<sup>97</sup> Adrian M. DuPuis and Robert Nordberg, Philosophy and Education: A Total View (Milwaukee: Bruce Publishing Company, 1968), p. 94.

<sup>98</sup> Gerald Lee Gutek, Pestalozzi and Education (New York: Random House, 1968), p. 112.

<sup>99</sup> Johann Heinrich Pestalozzi, How Gertrude Teaches Her Children, trans. Lucy E. Holland and Francis C. Turner (London: George Allen and Unwin, Ltd., 1915), p. 69.

<sup>100</sup> Jean Marc Itard, The Wild Boy of Aveyron (New York: Appleton-Century-Crofts, 1962).



approach to teaching children.<sup>101</sup>

Motor training was added to sense training by Itard's pupil, Edwin Sequin (1812-1880). Sequin trained the whole system and then the parts. He worked with eye-hand coordination, the auditory sense, voice, and vision.<sup>102</sup>

The influence of the earlier philosophers was felt by Maria Montessori (1870-1952), a twentieth-century theorist in educational methods, who developed her own materials for the multi-sensory approach to the education of children. Her basic method involved materials with length, breadth, height, color, texture, weight, size, and form.<sup>103</sup> Montessori's own words expressed best her method of teaching.

The technique of my method as it follows the guidelines of the natural physiological and physical development of the child, may be divided into three parts:

Motor Education  
Sensory Education  
Language.<sup>104</sup>

The educational principles of the early philosophers were similar to the principles of current educational theorists. Grzynkowicz stated that the application of these

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<sup>101</sup>Grzynkowicz, p. 31.

<sup>102</sup>Edwin Sequin, Idiocy and Its Treatment by the Physiological Method (New York: William Wood, 1866).

<sup>103</sup>Florence E. Ward, The Montessori Method and the American School (New York: Macmillan, 1913), pp. 3-4.

<sup>104</sup>Maria Montessori, Dr. Montessori's Own Handbook (New York: Fredrick A. Stokes, 1914), pp. 17-18.

ideas provided not only early training for obvious difficulties, but also the identification of subtle disabilities at an early age.<sup>105</sup>

### Visual Perception Skills

Visual perception was defined by Janet W. Lerner as "the identification, organization, and interpretation of sensory data received by the individual through the eye."<sup>106</sup> Marianne Frostig found in her studies that visual perception difficulties were the primary contributors to learning difficulties. She reported that children who had difficulty in writing seemed to be handicapped in eye-hand coordination and that children who could not recognize words often had disturbances in figure-ground perception.<sup>107</sup>

T. Wolf reported that good readers use successful information-seeking processes such as "symbol decoding, information interpretation and organization, and . . . various short- and long-term memory systems."<sup>108</sup>

Arthur V. Olson considered visual perception to be of

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<sup>105</sup>Wineva Grzynkiewicz, "A Critical Study of Methods of Teaching Children with Learning Disabilities" (Ed.D. dissertation, Marquette University, 1969), p. 84.

<sup>106</sup>Janet W. Lerner, Children with Learning Disabilities (Boston: Houghton Mifflin, 1971), p. 430.

<sup>107</sup>Marianne Frostig and Phyllis Maslow, "Language Training," Journal of Learning Disabilities, I (February, 1968), 20.

<sup>108</sup>T. Wolf, "Reading Reconsidered," Harvard Educational Review, XLVII (August, 1977), 427.

vast importance to learning.

Studies of beginning reading instruction seem to confirm the importance of skills of visual perception not only at readiness levels, but during the initial stages of instruction as well. Some studies report visual perception is even more important than native intelligence at the early levels.<sup>109</sup>

J. T. Goins suggested that many children made slow progress in learning to read because of ineffective visual perception.<sup>110</sup> He reported that these children compared favorably with their classmates in "ability to see, intelligence, language ability, and experience background."<sup>111</sup> In agreement with Goins, Patrick Ashlock and Alberta Stephen stressed that a "perceptual disorder can seriously hamper a child's learning."<sup>112</sup>

Frank R. Vellutino stated that students learning to read attended selectively to distinguishing visual features of letters and words.<sup>113</sup> An example provided was the child who

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<sup>109</sup>Arthur V. Olson, "Frostig Developmental Test of Visual Perception as a Predictor of Specific Reading Abilities with Second Grade Children," Elementary English Journal, XLIII (December, 1966), 869.

<sup>110</sup>J. T. Goins, Visual Perception Abilities and Early Reading Progress (Chicago: The University of Chicago Press, 1958), p. 2.

<sup>111</sup>Goins, p. 2.

<sup>112</sup>Patrick Ashlock and Alberta Stephen, Educational Therapy in the Elementary School (Springfield: Charles C. Thomas, 1966), p. 18.

<sup>113</sup>Frank R. Vellutino, "The Validity of Perceptual Deficit Explanations of Reading Disability: A Reply to Fletcher and Satz," Journal of Learning Disabilities, XII (March, 1979), 28.

used his knowledge of the sound represented by the letter "w" to assist him in distinguishing between "was" and "saw." The child, in contrast, who had not acquired such information dissected the orthography globally and was "not selectively attuned to the intraword word relationships required for making fine-grained distinctions."<sup>114</sup> He had a type of discrimination error in visual-spatial processing, calling "was" "saw" or "calm" "clam." Vellutino stated that such children could be described as inefficient in the processing of orthographic information.<sup>115</sup>

Wilma Jo Bush and Marian T. Giles indicated that some children did not remember graphic symbols because of distortions caused by visual perception, visual figure-ground, and visual-spatial problems. They reported that other children had difficulty remembering because the content varied according to meaning, which for unknown reasons made the content meaningless to some.<sup>116</sup>

Form perception referred to the perception of shape, size, and position of objects. Disturbances in form perception prevented the child from recognizing properties which distinguished a circle from a square or a triangle, according to Gerald Wallace and James A. McLoughlin.<sup>117</sup>

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<sup>114</sup>Vellutino, p. 28.      <sup>115</sup>Vellutino, p. 28.

<sup>116</sup>Wilma Jo Bush and Marian T. Giles, Aids to Psycholinguistic Teaching (Columbus, Ohio: Charles E. Merrill, 1977), p. 217.

<sup>117</sup>Gerald Wallace and James A. McLoughlin, Learning Disabilities (Columbus: Ohio: Charles E. Merrill, 1975), p. 85.

Frostig and Maslow reported that deficits in form perception contributed to problems of recognition of words or letters in different contexts. For example, the child had difficulty in identifying objects or drawings at different distances or angles, drawing diagrams of three-dimensional patterns, or finding all objects of a certain shape in a room.<sup>118</sup>

Bill R. Gearheart and Mel W. Weishahn reported that children with visual perceptual problems were not able to copy letters correctly or to perceive the difference between a hexagon and an octagon. Some children with visual perception skill difficulties reversed letters or produced mirror writing, according to the authors.<sup>119</sup>

The definition for figure-ground discrimination found most often in the literature was the ability to focus upon selected figures and screen out irrelevant stimuli in the background. Children with disturbances in this area appeared inattentive and very disorganized because they were constantly distracted by various stimuli. Wallace and McLoughlin found the children unable to sort objects according to shape and size. The children, as they grew older, had difficulty with the analysis and synthesis of words, phrases, and sentences

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<sup>118</sup>Frostig and Maslow, pp. 126-27.

<sup>119</sup>Bill R. Gearheart and Mel W. Weishahn, The Handicapped Child in the Regular Classroom (St. Louis: C. V. Mosby, 1976), p. 116.

involved in reading, according to the authors. Other examples of figure-ground discrimination disturbance were the inability to focus on one line of reading or one arithmetic problem out of a group of problems.<sup>120</sup>

Spatial discrimination referred in the literature to the ability to perceive the position of objects in space. Wallace and McLoughlin reported that difficulties in this area manifested themselves in the inability to reproduce patterns in beads or on a peg-board, to sequence letters in a word or words in a sentence, and/or to complete arithmetic processes.<sup>121</sup>

Visual-motor integration referred to the ability to integrate vision with movements of body parts, according to Wallace and McLoughlin. Disturbances in this area resulted in difficulties in buttoning, lacing, and cutting. A major problem for children with visual-motor deficits was copying from the chalkboard.<sup>122</sup>

Visual discrimination was suggested as the skill most closely related to beginning reading problems by Gillespie and Johnson. These authors described visual discrimination as "the ability to note differences and likenesses among geometric forms, letters, and words."<sup>123</sup>

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<sup>120</sup>Wallace and McLoughlin, p. 85.

<sup>121</sup>Wallace and McLoughlin, p. 86.

<sup>122</sup>Wallace and McLoughlin, p. 86.

<sup>123</sup>Patricia H. Gillespie and Lowell E. Johnson, Teaching Reading to the Mildly Retarded Child (Columbus, Ohio: Charles E. Merrill, 1974), p. 64.

Marianne Frostig reported that difficulty with discrimination resulted in failure to differentiate between the direction of letters, such as "b" and "d" and also the shape of similar letters, such as "n" and "r" or "n" and "m."<sup>124</sup>

Marvin Cohn and George Stricker reported that a reversal error in letter recognition occurred when a child looked at a symbol and assigned it the name of its inverted, rotated, or mirror image. The authors stated that the error occurred "most frequently with the complex of symbols b-d-p-q but also with other easily confused symbols such as u-n and m-w."<sup>125</sup>

Cohn and Stricker agreed with a study conducted by Fred L. Royer and Terrill R. Holland<sup>126</sup> concerning the recognition of uppercase and lowercase letters. The authors found no confusion among B, D, P, and Q because they were distinct forms and spatial orientation was not a factor in discrimination. Spatial orientation did become a factor in lowercase forms according to Cohn and Stricker.<sup>127</sup> This led the authors

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<sup>124</sup>Marianne Frostig, "The Needs of Teachers for Specialized Information on Reading," The Teacher of Brain-Injured Children: A Discussion of the Bases of Competency, ed. William M. Cruickshank (Syracuse, New York: Syracuse University Press, 1966), p. 94.

<sup>125</sup>Marvin Cohn and George Stricker, "Reversal Errors in Strong, Average, and Weak Letter Namers," Journal of Learning Disabilities, XII (October, 1979), 35.

<sup>126</sup>Fred L. Royer and Terrill R. Holland, "Rotational Transformation of Visual Figures as a Clinical Phenomenon," Psychological Bulletin, LXXXII (November, 1975), 843-68.

<sup>127</sup>Cohn and Stricker, p. 38.

to predict a developmental sequence "in which the child at first will name few letters correctly because he has neither an awareness of letter parts nor an awareness of the importance of spatial orientation."<sup>128</sup> Later as the child learned to look for letter parts, letter recognition increased and the number of errors decreased.<sup>129</sup>

Cohn and Stricker stated that when persistent errors existed beyond the developmental stage then they were found to be associated with a basic perceptual or cognitive deficit. The authors stressed that "these deficits will interfere with reading at whatever stage they occur."<sup>130</sup>

A study designed to compare the effectiveness of orolographic reading instruction and traditional methods of reading instruction for disabled children was conducted by Ned Ratekin in 1979.<sup>131</sup> He found that "the orolographic group scored significantly higher than the control group." Ratekin concluded that the orolographic program "proved to be a more effective instructional method than the regular procedures used in reading instruction for disabled learners."<sup>132</sup>

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<sup>128</sup>Cohn and Stricker, p. 38.

<sup>129</sup>Cohn and Stricker, p. 38.

<sup>130</sup>Cohn and Stricker, p. 38.

<sup>131</sup>Ned Ratekin, "Reading Achievement of Disabled Learners," Exceptional Children, XL (March, 1979), 458.

<sup>132</sup>Ratekin, p. 458.



Robert M. Golinkoff compared good and poor comprehenders. She summarized her findings:

Good comprehenders seem to use a scan-for-meaning pattern which can be flexibly applied to suit their varied purposes. Skilled comprehenders clearly treat reading as a process through which to gain information about events and relations to the world.<sup>133</sup>

Golinkoff described the poor comprehender in the following manner:

The poor comprehender seems to read text in a word-by-word manner, with a minimum of text organization. The poor comprehender is also generally inflexible to variations in task demands.<sup>134</sup>

Cheryl J. Gowie reported that recent research emphasized the critical and necessary contribution of the listener or the reader in deriving meaning from linguistic input.<sup>135</sup> She suggested that the result of this emphasis has shifted the focus of attention of much psycholinguistic research from the characteristics of language to characteristics of individual language users.<sup>136</sup>

Mary P. Melvin discussed in her study, "Psycholinguistics and the Teaching of Reading," the process of reading. She

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<sup>133</sup>Roberta M. Golinkoff, "A Comparison of Reading Comprehension in Good and Poor Comprehenders," Reading Research Quarterly, XI (1975-1976), 654.

<sup>134</sup>Golinkoff, p. 655.

<sup>135</sup>Cheryl J. Gowie, "Psycholinguistic Strategies for Improving Reading Comprehension," Elementary School Journal, LXXIX (November, 1978), 68.

<sup>136</sup>Gowie, p. 68.

listed five principles used in helping children to read. They were: reading is a global activity; children learn in different ways; prior knowledge of language should be used; perfection at first attempt is not important; and graphic, syntactic, and semantic clues are available.<sup>137</sup>

Melvin concluded her remarks by saying that even though a book said "Pat did not dare miss because the coach was watching," and the student may read, "Pat did not dare miss the ball because the coach was watching," a wise teacher praised the child for a good job. The teacher knew that the student was "using personal knowledge of the language in the process of becoming an independent reader."<sup>138</sup>

M. J. Adams, R. C. Anderson, and D. Durkin stressed that successful reading emerges as a highly complex, interactive process in which what the reader brings to the page is as important as what is written. That is why comprehension always is a highly personal experience.<sup>139</sup>

### Summary

Chapter 2 has presented a review of literature related to psycholinguistic elements which affected learning among

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<sup>137</sup>Mary P. Melvin, "Psycholinguistics and the Teaching of Reading," Elementary School Journal, LXXIX (May, 1979), 281-82.

<sup>138</sup>Melvin, p. 283.

<sup>139</sup>M. J. Adams, R. C. Anderson, and D. Durkin, Beginning Reading: Theory and Practice. Reading Education Report No. 3. (Urbana-Champaign: Center for the Study of Reading, University of Illinois, 1977), p. 11.

early elementary children. The elements were categorized into the psycholinguistic components of auditory perception skills, language skills, motor skills, and visual perception skills. The design of the study in Chapter 3 describes the population and sample, procedures, instrumentation, student tasks, personnel required, space needed, equipment, and budget considerations utilized in this study.

## Chapter 3

### DESIGN OF THE STUDY

#### Introduction

The design of the study included the following components: population and sample, procedures, instrumentation, student tasks, personnel required, space needed, equipment, and budget considerations.

#### Population and Sample

First, second, and third grade level students from the University School, East Tennessee State University, Johnson City, Tennessee comprised the population for the study. The enrollment in the early elementary classes (first, second, and third year enrollees) for 1980-1981 was seventy-five students, twenty-five in each grade level.

Names of the students for each grade level were alphabetized and assigned consecutive numbers starting at 00 and ending at 24 for grade level one, starting at 25 and ending at 49 for grade level two, and starting at 50 and ending at 74 for grade level three. Using a table of random numbers and the two-digit student numbers for each grade level, three test groups were stratified and randomly selected. The procedure yielded a sample of thirty-six students, eighteen males and eighteen females, who comprised the three groups

Group 1 - 12 students (6 males, 6 females)  
 Group 2 - 12 students (6 males, 6 females)  
 Group 3 - 12 students (6 males, 6 females)

Each of the three groups in the sample was stratified and divided randomly into two groups containing an equal number of males and females. These groups were labeled experimental groups and control groups. The resulting assignments were as follows:

Groups 1<sub>E</sub> - 6 students (3 males, 3 females)  
 Groups 1<sub>C</sub> - 6 students (3 males, 3 females)  
 Groups 2<sub>E</sub> - 6 students (3 males, 3 females)  
 Groups 2<sub>C</sub> - 6 students (3 males, 3 females)  
 Groups 3<sub>E</sub> - 6 students (3 males, 3 females)  
 Groups 3<sub>C</sub> - 6 students (3 males, 3 females)

### Procedures

A request for review of the study involving human subjects was sent for preliminary approval to the short-review subcommittee of the Institutional Review Board (Appendix B). A completed copy of the Informed Consent Form was included in the request (Appendix C). Recommendations of the subcommittee were presented to the full Institutional Review Board for final formal approval.

The Informed Consent Form was sent to the parents or guardian of every sample member. Each form was signed by the subject, parents/guardian, and researcher.

The Illinois Test of Psycholinguistic Abilities was administered to the children in the sample. The test results were recorded, noting psycholinguistic deficiencies for the

subjects as appropriate.

A series of reading lesson plans was taught for an instructional period of twenty-one sessions to both the control groups and experimental groups by regularly assigned teachers. These plans emphasized vocabulary development, word analysis, and reading comprehension, drawn from appropriate graded readers. Behavioral objectives, appropriate activities, and evaluation components were included for each lesson taught.

The experimental groups were provided prescribed psycholinguistic instructional aids selected to remediate specifically noted deficiencies following the presentation of each lesson.

The control groups received "pseudo" treatment designed to control for Hawthorne effect, which might have been present.

The Illinois Test of Psycholinguistic Abilities was re-administered to experimental groups and control groups upon completion of the twenty-one sessions of instruction.

The null form for each of the research hypotheses was tested as stated below:

#### Research Hypotheses

$$H1: E_1 \neq C_1$$

$$H2: E_2 \neq C_2$$

$$H3: E_3 \neq C_3$$

$$H4: E_1 + E_2 + E_3 \neq C_1 + C_2 + C_3$$

#### Null Hypotheses

$$H_{01}: E_1 = C_1$$

$$H_{02}: E_2 = C_2$$

$$H_{03}: E_3 = C_3$$

$$H_{04}: E_1 + E_2 + E_3 = C_1 + C_2 + C_3$$

The statistical technique used to analyze and interpret the data was the analysis of covariance. The covariate for

the analysis was the pretest. The purpose of the test was to determine whether there was a difference in the performance of the experimental groups and the control groups on the re-administration of the Illinois Test of Psycholinguistic Abilities. The level of significance used for the study was 0.05. Data were processed through the East Tennessee State University Computer Center.

### Instrumentation

The Illinois Test of Psycholinguistic Abilities administered to the subjects in the study was a revised edition of the Experimental Edition published in 1961. The revision of ITPA was made to "improve the subtests and to add tests for abilities which were not tapped in the original battery."<sup>1</sup> The revised battery contained the ten basic tests and two supplementary tests listed below:<sup>2</sup>

- I. Representation Level
  - A. Auditory Reception
  - B. Visual Reception
  - C. Auditory Association
  - D. Visual Association
  - E. Verbal Expression
  - F. Manual Expression

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<sup>1</sup>Samuel A. Kirk, James J. McCarthy, and Winifred D. Kirk, Examiner's Manual: Illinois Test of Psycholinguistic Abilities (Urbana: University of Illinois Press, 1968), p. 3.

<sup>3</sup>Kirk, McCarthy, and Kirk, p. 90.

## II. Automatic Level

- A. Grammatical Closure
- B. Visual Closure
- C. Auditory Sequential Memory
- D. Visual Sequential Memory

## III. Supplementary Tests

- A. Auditory Closure
- B. Sound Blending

The objective of the Illinois Test of Psycholinguistic Abilities was to "delineate specific abilities and disabilities in children in order that remediation may be undertaken."<sup>3</sup> ITPA provided "(a) a framework within which tests of discrete and educationally significant abilities have been generated; (b) a base for the development of instructional programs for children."<sup>4</sup>

The dual purpose of the diagnostic/teaching test allowed it to serve not only as an evaluation model but also as a selection and programming model for remedial psycholinguistic instruction.<sup>5</sup> The three-dimensional model of the Illinois Test of Psycholinguistic Abilities is shown in Figure 1.<sup>6</sup>

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<sup>3</sup>Kirk, McCarthy, and Kirk, p. 5.

<sup>4</sup>Kirk, McCarthy, and Kirk, p. 5.

<sup>5</sup>Kirk, McCarthy, and Kirk, p. 5.

<sup>6</sup>Kirk, McCarthy, and Kirk, p. 8.



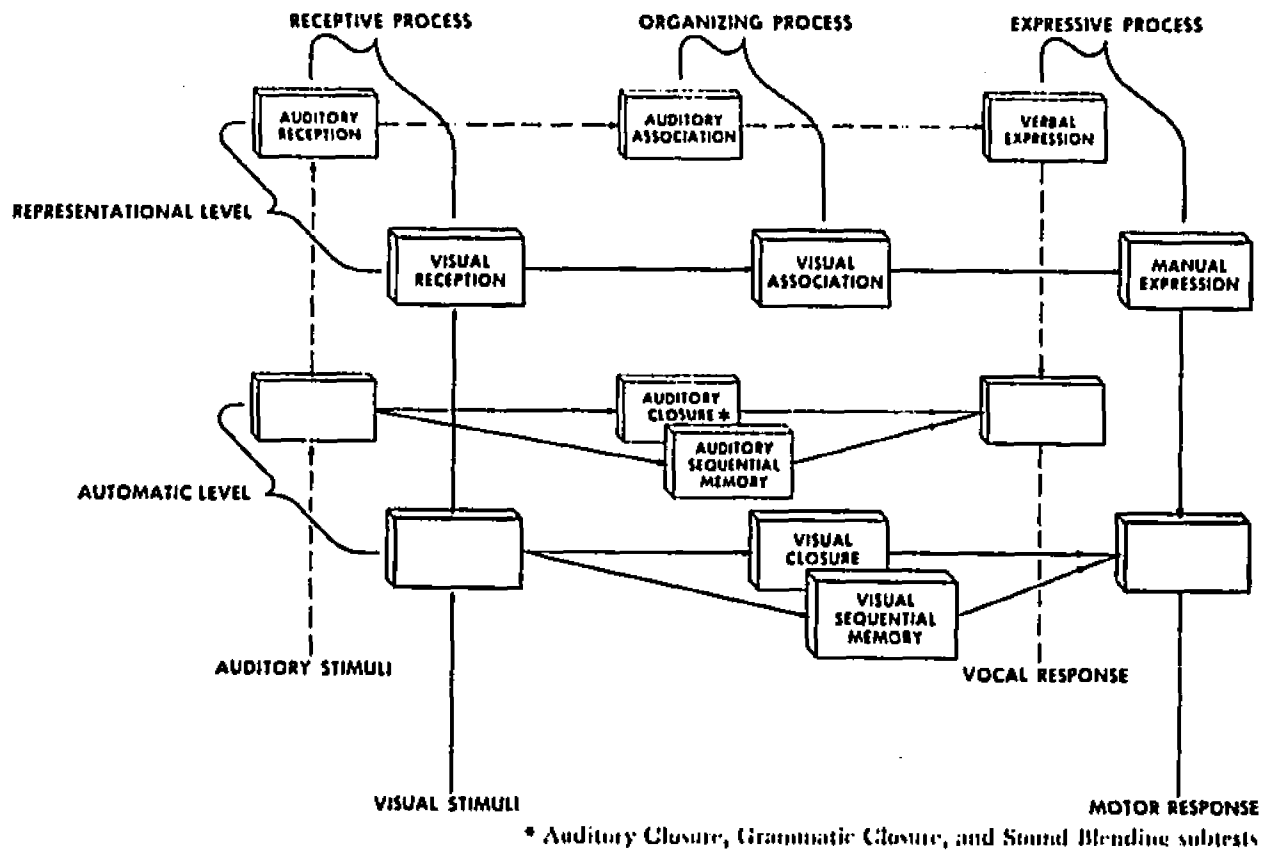


Figure 1  
Three-Dimensional Model of the ITPA

The reliability of the Illinois Test of Psycholinguistic Abilities referred to its accuracy of measurements and reflected "the degree of self-consistency among scores earned by an individual."<sup>7</sup> Two related aspects of reliability were internal consistency and stability. The extent to which items of the test represented "a homogeneous set of measurements of some simple underlying trait"<sup>8</sup> reflected internal consistency. The stability of the test reflected "the extent to which the test yielded consistent results from testing to testing,"<sup>9</sup> thus indicating the dependability of ITPA for predictive purposes. The reliability coefficient and the standard error of measurement were the two indices used for test reliability.

The internal consistency coefficients for each ITPA subtest and the ITPA composite by age level for the 962 average children of the standardization sample were as shown in Table 1.<sup>10</sup>

The internal consistency coefficients corrected for restricted intelligence range were as shown in Table 2.<sup>11</sup>

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<sup>7</sup> John N. Paraskevopoulos and Samuel A. Kirk, The Development and Psychometric Characteristics of the Revised Illinois Test of Psycholinguistic Abilities (Urbana: University of Illinois Press, 1969), p. 95.

<sup>8</sup> Paraskevopoulos and Kirk, p. 95.

<sup>9</sup> Paraskevopoulos and Kirk, p. 95.

<sup>10</sup> Paraskevopoulos and Kirk, pp. 101-2.

<sup>11</sup> Paraskevopoulos and Kirk, p. 103.

Table 1

Internal Consistency Coefficients  
for the Twelve ITPA Subtests and ITPA Composite by Age Level

<u>Restricted Intelligence Range</u>								
ITPA Subtests	<u>Age Level</u>							
	2-7/3-1	3-7/4-1	4-7/5-1	5-7/6-1	6-7/7-1	7-7/8-1	8-7/9-1	9-7/10-1
<b>A. <u>Main Subtests</u></b>								
Auditory Reception	.84	.90	.89	.91	.91	.91	.88	.84
Visual Reception	.85	.85	.86	.86	.87	.76	.73	.74
Auditory Association	.81	.84	.85	.76	.80	.76	.83	.74
Visual Association	.79	.82	.82	.75	.76	.79	.82	.80
Verbal Expression	.54	.67	.76	.51	.75	.79	.78	.77
Manual Expression	.85	.81	.83	.82	.82	.77	.80	.81
Grammatic Closure	.67	.69	.69	.61	.71	.74	.65	.60
Visual Closure	.53	.49	.59	.66	.65	.71	.70	.66
Auditory Sequential	.74	.81	.83	.87	.81	.90	.90	.90
Visual Sequential	.96	.74	.74	.69	.51	.68	.70	.68
<b>B. <u>Composite</u></b>	.92	.92	.93	.87	.90	.90	.91	.89
<b>C. <u>Supplementary</u></b>								
Auditory Closure	.79	.84	.82	.78	.64	.64	.45	.48
Sound Blending	.79	.78	.81	.80	.87	.91	.87	.88

Table 2

Internal Consistency Coefficients  
for the Twelve ITPA Subtests and ITPA Composite by Age Level

Corrected for Restricted Intelligence Range

ITPA Subtests	Age Level							
	2-7/3-1	3-7/4-1	4-7/5-1	5-7/6-1	6-7/7-1	7-7/8-1	8-7/9-1	9-7/10-1
<u>A. Main Subtests</u>								
Auditory Reception	.91	.96	.95	.95	.95	.95	.95	.90
Visual Reception	.90	.92	.92	.90	.93	.82	.86	.87
Auditory Association	.91	.94	.94	.86	.91	.89	.92	.89
Visual Association	.87	.90	.90	.87	.80	.89	.90	.91
Verbal Expression	.76	.80	.86	.72	.85	.86	.88	.86
Manual Expression	.89	.91	.88	.88	.89	.82	.84	.87
Grammatic Closure	.84	.87	.80	.81	.88	.89	.82	.80
Visual Closure	.68	.67	.75	.75	.69	.82	.85	.76
Auditory Sequential	.85	.88	.89	.90	.85	.92	.92	.95
Visual Sequential	.96	.85	.85	.74	.60	.80	.75	.83
<u>B. Composite</u>	.96	.96	.96	.92	.95	.94	.95	.96
<u>C. Supplementary</u>								
Auditory Closure	.79	.91	.90	.88	.80	.76	.45	.69
Sound Blending	.84	.88	.88	.84	.89	.95	.89	.90

Means and standard deviations of raw scores for the twelve ITPA, ITPA composite, and the psycholinguistic quotients are shown in Table 3.<sup>12</sup>

The stability coefficients for the twelve subtests, the composite, and the psycholinguistic quotient are shown in Table 4.<sup>13</sup>

J. Lee Wiederholt reported that several investigations with regard to reliability of ITPA had been made.<sup>14</sup> He stated that only Paraskevopoulos and Kirk had studied reliability at individual age levels.<sup>15</sup> Median internal consistencies (corrected for restricted intelligence range of .80 or better on all subtests except visual closure) were reported by Paraskevopoulos and Kirk.<sup>16</sup> Wiederholt stressed that other researchers had worked with children varying widely in age, which seriously limited the confidence of their results.<sup>17</sup> He also suggested that a shorter time interval between the test and retest was needed.<sup>18</sup>

Wiederholt reported that several factor analyses had been conducted on the ITPA, either alone or in conjunction

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<sup>12</sup>Paraskevopoulos and Kirk, p. 106.

<sup>13</sup>Paraskevopoulos and Kirk, p. 108.

<sup>14</sup>Oscar Krisen Buros, ed., The Eighth Mental Measurement Yearbook (Vol. 1; Highland Park, New Jersey: The Gryphon Press, 1978), p. 431.

<sup>15</sup>Buros, p. 431.

<sup>16</sup>Buros, p. 431.

<sup>17</sup>Buros, p. 431.

<sup>18</sup>Buros, p. 431.

Table 3

Means and Standard Deviations of Five-Month Test-Retest ITPA Raw Scores  
with 4-Year, 6-Year, and 8-Year-Old Children

ITPA Subtests	4-Year-Olds (N=71)				6-Year-Olds (N=55)				8-Year-Olds (N=72)			
	Pretest		Posttest		Pretest		Posttest		Pretest		Posttest	
A. <u>Main Subtests</u>	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Auditory Reception	12.8	6.55	14.5	5.79	24.8	6.84	28.1	7.77	33.4	7.14	35.3	6.92
Visual Reception	8.2	4.21	10.5	4.58	17.4	5.37	22.6	4.77	24.8	4.21	26.9	5.91
Auditory Association	8.5	4.18	11.4	4.18	21.6	5.78	25.1	4.09	27.7	5.77	30.1	5.48
Visual Association	9.2	4.40	12.3	4.96	19.0	3.90	22.1	3.98	25.2	4.30	26.2	4.30
Verbal Expression	9.2	3.88	11.8	4.48	20.1	6.98	21.3	7.45	31.6	9.22	30.4	7.22
Manual Expression	11.9	6.00	14.4	5.36	19.9	5.87	22.1	4.34	25.7	4.83	26.5	4.97
Grammatical Closure	6.5	3.00	8.4	3.10	16.4	3.62	18.6	3.12	23.5	4.20	25.1	4.17
Visual Closure	8.6	3.00	12.0	3.69	18.3	4.45	23.0	4.79	26.4	5.34	31.6	5.75
Auditory Sequential	12.0	5.41	14.1	4.67	20.9	5.97	22.8	5.55	28.8	8.94	29.9	8.95
Visual Sequential	7.2	4.20	9.6	3.96	16.0	3.50	17.7	3.76	20.6	3.61	20.7	3.59
B. <u>Composite</u>	94.1	24.51	119.0	25.15	194.0	25.16	221.4	22.73	265.7	24.73	282.7	25.36
C. <u>Supplementary</u>												
Auditory Closure	7.7	4.70	10.5	4.36	16.6	4.31	19.3	3.83	20.8	3.21	22.8	3.14
Sound Blending	5.5	3.39	7.1	3.93	10.1	3.30	12.4	4.34	19.3	6.21	19.8	5.93
D. <u>Psycholinguistic Quotient</u>	99.0	12.81	102.5	10.66	101.0	9.60	102.8	8.63	99.3	9.92	99.1	9.61

Table 4

Five-Month Stability Coefficients for the ITPA Scores  
for 4-Year, 6-Year, and 8-Year-Old Children

ITPA Subtests	Restricted Range			Corrected for Restricted Intelligence		
	4-Year-Olds	6-Year-Olds	8-Year-Olds	4-Year-Olds	6-Year-Olds	8-Year-Olds
A. <u>Main Subtests</u>						
Auditory Reception	.56	.36	.40	.79	.63	.63
Visual Reception	.35	.21	.36	.69	.56	.66
Auditory Association	.71	.70	.62	.90	.86	.83
Visual Association	.57	.32	.38	.75	.45	.67
Verbal Expression	.45	.46	.49	.74	.63	.74
Manual Expression	.51	.49	.40	.67	.70	.55
Grammatic Closure	.56	.49	.72	.72	.78	.87
Visual Closure	.57	.66	.68	.72	.70	.82
Auditory Sequential	.61	.82	.86	.75	.86	.89
Visual Sequential	.50	.36	.12	.71	.38	.23
B. <u>Composite</u>	.83	.70	.70	.93	.87	.87
C. <u>Supplementary</u>						
Auditory Closure	.52	.48	.36	.73	.71	.71
Sound Blending	.51	.30	.63	.69	.42	.54
D. <u>Psycholinguistic Quotient</u>	.79	.69	.66	.91	.87	.86

with other standardized tests to determine construct validity.<sup>19</sup> He further stated that in two investigations the subtests were factored, using criterion tests. The ITPA constructs of level of organization and processes of communication were substantiated in both studies.<sup>20</sup> Wiederholt concluded that those who use the test as a measure of the Osgood-Kirk constructs can do so with an appreciable amount of confidence.<sup>21</sup>

A predictive validity study of ITPA was reported by A. Hirshoren in 1969.<sup>22</sup> The conclusion drawn from the investigation was that "in general, the subtests at the automatic level were significantly related to school achievement two years later."<sup>23</sup>

Based upon the investigations which were reported in The Eighth Mental Measurement Yearbook and the reports of Samuel A. Kirk and Winifred D. Kirk, along with the studies of John N. Paraskevopoulos and Samuel A. Kirk, it appeared that the Illinois Test of Psycholinguistic Abilities was a reliable and valid instrument.

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<sup>19</sup>Buros, p. 431.

<sup>20</sup>Buros, p. 431.

<sup>21</sup>Buros, p. 431.

<sup>22</sup>Samuel A. Kirk and Winifred D. Kirk, Psycholinguistic Learning Disabilities: Diagnosis and Remediation (Urbana: University of Illinois Press, 1972), p. 29.

<sup>23</sup>Kirk and Kirk, p. 29.



### Student Tasks

The student tasks involved in the study included taking of tests, participating in regular reading assignments, and participating in treatment (prescribed or "pseudo"). The Illinois Test of Psycholinguistic Abilities was administered to the sample. Deficiencies for the subjects were noted. Regularly assigned teachers taught a series of reading lessons to the sample. Each lesson included behavioral objectives, appropriate activities, and evaluation.

Prescribed psycholinguistic instructional aids selected to remediate specifically noted deficiencies were provided to the experimental groups following the presentation of each reading lesson. "Pseudo" treatments were provided to the control groups following the presentation of each reading lesson. The treatments were designed to control for Hawthorne effect. The Illinois Test of Psycholinguistic Abilities was re-administered to the sample, the experimental groups and the control groups, at the conclusion of twenty-one sessions of instruction.

### Personnel Required

The personnel required for the study were first, second, and third grade (the researcher) level University School instructors, students in reading at East Tennessee State University, and student teachers in elementary education.

The University School instructors had a combined teaching

experience of forty-four years in the early elementary grades. Each instructor had graduate work beyond the Masters Degree in elementary education. The researcher conducted numerous orientation and planning meetings with the instructors. The instructors presented twenty-one sessions of prescribed psycholinguistic instructional aids to the experimental groups. Daily evaluations were made on the progress of the study by the instructors and researcher.

The one undergraduate and three graduate students in reading met with Dr. John Taylor, director of the Reading Division, and the researcher for orientation and planning. The students were instructed in the use and purpose of the Illinois Test of Psycholinguistic Abilities. The pretest and posttest for the study were administered by the students.

Student teachers in elementary education assigned to the University School for the fall semester, 1980, in grade levels one, two, and three were provided an orientation program by the researcher. The student teachers were under the direct supervision of the University School instructors for their presentation of twenty-one sessions of "pseudo" treatments to the control groups.

#### Space Needed

The suites of rooms in the first, second, and third grade levels of the University School provided necessary space needed for testing, lesson presentations, and treatment

sessions. Each grade level had available at least two rooms for use in the study.

### Equipment

Desks, chairs, and appropriate graded readers were furnished by the University School. Testing materials were provided by the Reading Division of the Department of Curriculum and Instruction. Record forms were provided by the researcher, as were materials needed for remedial instructional sessions and "pseudo" treatment sessions.

### Budget Considerations

The Reading Division of the Department of Curriculum and Instruction provided the Illinois Test of Psycholinguistic Abilities testing materials. All materials not provided by the University School or the Reading Division with regard to the twenty-one sessions of prescribed instructional aids and the "pseudo" treatments were provided by the researcher.

### Summary

Chapter 3 included the population and sample, procedures, instrumentation, student tasks, personnel required, space needed, equipment, and budget considerations for the study. The presentation and analysis of data are described in Chapter 4.

## Chapter 4

### PRESENTATION AND ANALYSIS OF DATA

#### Introduction

First, second, and third grade level students from the University School, East Tennessee State University, Johnson City, Tennessee were stratified and randomly selected for three test groups. The procedure yielded the sample of thirty-six students, eighteen males and eighteen females.

Each of the three groups in the sample was randomly divided into two groups containing three males and three females. These groups were labeled the experimental groups and the control groups.

The Illinois Test of Psycholinguistic Abilities was administered to the sample by one undergraduate and four graduate students in reading from East Tennessee State University. The test results were recorded for each subject noting psycholinguistic deficiencies.

A series of reading lessons was taught for an instructional period of twenty-one sessions to both the experimental groups and the control groups by the first, second, and third grade level University School instructors. The lessons emphasized vocabulary development, word analysis, and reading comprehension drawn from appropriate graded readers. Behavioral objectives, appropriate activities, and evaluation

components were included for each lesson taught.

The experimental groups were provided thirty-minute sessions of individually prescribed psycholinguistic instructional aids selected to remediate specifically noted deficiencies by the first, second, and third grade level instructors following the presentation of each reading lesson. The three teachers rotated grade levels after the completion of every seven instructional periods to provide crossover instruction for the elimination of teacher bias.

The control groups received "pseudo" treatment by student teachers designed to control for the Hawthorne effect during the time the experimental groups received individually prescribed psycholinguistic instructional aids.

The Illinois Test of Psycholinguistic Abilities was re-administered to the sample by graduate students in reading from East Tennessee State University upon completion of twenty-one sessions of instruction.

The null form for each of the research hypotheses was tested. The statistical technique used to analyze and interpret the data was the analysis of covariance. The covariate was the pretest. The level of significance used in the study was 0.05. Data were processed at the Office of Computer Services, East Tennessee State University.

### Presentation of the Data

The Illinois Test of Psycholinguistic Abilities was given individually to the thirty-six subjects as a pretest. Twenty-one thirty-minute sessions of prescribed psycholinguistic instructional aids were provided the experimental groups at the same time twenty-one sessions of "pseudo" treatment were provided the control groups. The Illinois Test of Psycholinguistic Abilities was re-administered individually to the sample as a posttest. Data collected for each subject on the pretest and the posttest were recorded on individual Profile of Abilities sheets.

Means, mean scores increase or decrease, and percentages of increase or decrease for the control group and the experimental group for grade level one are shown in Table 5. The average mean score increase for the control group was 2 points, while the average mean score increase for the experimental group was 5 points. The experimental group had a gain of more than two times that of the control group.

The smallest increase for mean scores for the control group was 0 and the largest was 5 points. The greatest mean score decrease for the experimental group was minus 2 points and the highest increase was 9 points. The lowest percentage of increase for the control group was 0 and the highest was 15 percent. A minus 6 was the greatest percentage of decrease for the experimental group with the highest increase of 27 percent.

Table 5

Pretest Means, Posttest Means, Mean Scores Increase or Decrease  
and Percentages of Increase or Decrease for Illinois Test  
of Psycholinguistic Abilities Test - Retest by Groups  
for Grade 1

Groups	Pretest Means	Posttest Means	Mean Scores Increase or Decrease	Percentages Increase or Decrease
Control Group				
ID 1	35	38	+3	+ 9%
ID 2	45	47	+2	+ 4%
ID 3	34	39	+5	+15%
ID 4	33	35	+2	+ 6%
ID 5	44	44	0	0%
ID 6	41	43	+2	+ 5%
Average Increase			<u>2</u>	
Experimental Group				
ID 7	34	43	+9	+26%
ID 8	34	40	+6	+17%
ID 9	42	42	0	0%
ID 10	27	36	+9	+33%
ID 11	36	34	-2	- 6%
ID 12	33	42	+9	+27%
Average Increase			<u>5</u>	

Note. Increase +; decrease -  
Control group n = 6  
Experimental group n = 6

Table 6 contains lists of mean scores, mean scores increase or decrease, and percentages of increase or decrease for males and females in the control group and the experimental group for grade level one. The average mean score increase was 1 point for the male control group and 5 points for the male experimental group. The male experimental group had five times as much increase for the average mean score as the male control group.

The average mean score increase for the female control group was 3 points and for the female experimental group 5 points. The male and female experimental groups showed greater average mean score increases than the male and female control groups.

The mean scores increase for the male control group ranged from 0 to 2 points with percentages of increase from 0 to 6 percent. The male experimental group ranged from a decrease of 2 points to an increase of 9 points on mean scores with percentages ranging from minus 6 percent to plus 33 percent.

The female control group ranged from 2 points to 5 points on mean scores increase and from 4 percent to 15 percent for percentages of increase. The range for the female experimental group on mean scores increase was from 0 to 9 points and on percentages of increase from 0 to 26 percent.



Table 6

Pretest Means, Posttest Means, Mean Scores Increase or Decrease, and Percentages of Increase or Decrease for Illinois Test of Psycholinguistic Abilities Test-Retest by Sex by Group for Grade 1

Sex and Groups	Pretest Means	Posttest Means	Mean Scores Increase or Decrease	Percentages Increase or Decrease
<u>Males</u>				
Control Group				
ID 4	33	35	+2	+6%
ID 5	44	44	0	0%
ID 6	41	43	+2	+5%
Average Increase			<u>1</u>	
Experimental Group				
ID 10	27	36	+9	+33%
ID 11	36	34	-2	- 6%
ID 12	33	42	+9	+27%
Average Increase			<u>5</u>	
<u>Females</u>				
Control Group				
ID 1	35	38	+3	+ 9%
ID 2	45	47	+2	+ 4%
ID 3	34	39	+5	+15%
Average Increase			<u>3</u>	

Table 6 (continued)

Sex and Groups	Pretest Means	Posttest Means	Mean Scores Increase or Decrease	Percentages Increase or Decrease
Experimental Group				
ID 7	34	43	+9	+26%
ID 8	34	40	+6	+17%
ID 9	42	42	0	0%
Average Increase			<u>5</u>	

Note. Increase +; decrease -  
 Male control group n = 3  
 Male experimental group n = 3  
 Female control group n = 3  
 Female experimental group n = 3

Means, mean scores increase or decrease, and percentages of increase or decrease for the second grade level control group and experimental group are presented in Table 7. The average mean score increase for the control group was 4 points and for the experimental group 5 points. The experimental group had a slightly higher increase for the average mean than the control group.

The lowest mean scores increase for the control group was 1 point with the highest increase of 5 points. The least percentage increase was 2 percent and the greatest was 17 percent for the control group. The experimental group's lowest mean scores increase was 3 points and the highest was 9 points. The least percentage of increase was 8 percent and the greatest was 13 percent for the experimental group.

Table 8 contains the means, mean scores increase or decrease, and percentages of increase or decrease for males in the control group and the experimental group and females in the control group and the experimental group for grade level two. Males in the control group had an average mean score gain of 5 points while the experimental group of males had an average mean score gain of 4 points. The male control group and the male experimental group had increases in average mean scores. The male control group, however, had a higher increase than the male experimental group.

Females in the control group had an average mean score gain of 2 points and the experimental group of females had

Table 7

Pretest Means, Posttest Means, Mean Scores Increase or Decrease, and Percentages of Increase or Decrease for Illinois Test of Psycholinguistic Abilities Test-Retest by Groups for Grade 2

Groups	Pretest Means	Posttest Means	Mean Scores Increase or Decrease	Percentages Increase or Decrease
Control Group				
ID 13	40	45	+5	+13%
ID 14	35	40	+5	+14%
ID 15	43	44	+1	+ 2%
ID 16	41	42	+1	+ 2%
ID 17	37	41	+4	+11%
ID 18	30	35	+5	+17%
Average Increase			<u>4</u>	
Experimental Group				
ID 19	38	41	+3	+ 3%
ID 20	38	43	+5	+13%
ID 21	33	42	+9	+27%
ID 22	34	37	+3	+ 9%
ID 23	43	47	+4	+ 9%
ID 24	41	45	+4	+10%
Average Increase			<u>5</u>	

Note. Increase +; decrease -  
Control group n = 6  
Experimental group n = 6

Table 8

Pretest Means, Posttest Means, Mean Scores Increase or Decrease, and Percentages of Increase or Decrease for Illinois Test of Psycholinguistic Abilities Test-Retest by Sex by Group for Grade 2

Sex and Groups	Pretest Means	Posttest Means	Mean Scores Increase or Decrease	Percentages Increase or Decrease
<u>Males</u>				
Control Group				
ID 13	40	45	+5	+13%
ID 17	37	41	+4	+11%
ID 18	30	35	+5	+17%
Average Increase			<u>5</u>	
Experimental Group				
ID 22	34	37	+3	+ 9%
ID 23	43	47	+4	+ 9%
ID 24	41	45	+4	+10%
Average Increase			<u>4</u>	
<u>Females</u>				
Control Group				
ID 14	35	40	+5	+14%
ID 15	43	44	+1	+ 2%
ID 16	41	42	+1	+ 2%
Average Increase			<u>2</u>	

Table 8 (continued)

Sex and Groups	Pretest Means	Posttest Means	Mean Scores Increase or Decrease	Percentages Increase or Decrease
Experimental Group				
ID 19	38	41	+3	+ 8%
ID 20	38	43	+5	+13%
ID 21	33	42	+9	+27%
Average Increase			<u>6</u>	

Note. Increase +; decrease -  
 Male control group n = 3  
 Male experimental group n = 3  
 Female control group n = 3  
 Female experimental group n = 3

an average mean score increase of 6 points. The female experimental group had three times as much increase for the average mean score as the female control group.

The mean scores increase for the male control group ranged from 4 points to 5 points with a percentage increase range from 11 percent to 17 percent. The male experimental group had a range of increase from 3 points to 4 points for mean scores and from 9 percent to 10 percent for percentages.

The female control group ranged from 1 point to 5 points on mean scores gain and from 2 percent to 14 percent on percentages gain. The range for the female experimental group on mean score increase was 3 points to 9 points and on percentages of increase from 8 percent to 27 percent.

Means, mean scores increase or decrease, and percentages of increase or decrease for grade level three control and experimental groups are listed in Table 9. The control group had an average mean score increase of 1 point while the experimental group had an average mean score increase of 4 points. The experimental group had four times as much gain for the average mean score as the control group.

The mean scores increase for the control group ranged from 0 to 5 points with a range from 0 to 14 percent for percentages of increase. The experimental group ranged from minus 1 point to plus 6 points for mean scores and from minus 3 percent to plus 18 percent for percentages.

Table 9

Pretest Means, Posttest Means, Mean Scores Increase or Decrease, and Percentages of Increase or Decrease for Illinois Test of Psycholinguistic Abilities Test-Retest by Groups for Grade 3

Groups	Pretest Means	Posttest Means	Mean Scores Increase or Decrease	Percentages Increase or Decrease
Control Group				
ID 25	42	41	-1	-2%
ID 26	40	42	+2	+5%
ID 27	40	42	+2	+5%
ID 28	38	37	-1	-3%
ID 29	39	39	0	0%
ID 30	35	40	+5	+14%
Average Increase			<u>1</u>	
Experimental Group				
ID 31	43	48	+5	+11%
ID 32	36	35	-1	-3%
ID 33	35	39	+4	+11%
ID 34	35	37	+2	+6%
ID 35	36	42	+6	+17%
ID 36	33	39	+6	+18%
Average Increase			<u>4</u>	

Note. Increase +; decrease -  
Control group n = 6  
Experimental group n = 6



The means, mean scores increase or decrease, and the percentages of increase or decrease for the male control and experimental groups and the female control and experimental groups for grade level three are displayed in Table 10. The male control group had an average mean score increase of 1 point while the experimental group had an increase of 3 points. The male experimental group had a slightly higher increase for the average mean score than the male control group.

The female control group gained 1 point on the average mean score increase while the experimental group had a gain of 5 points. The female experimental group had five times as much increase for the average mean score as the control group. The female experimental group had a greater gain than the male experimental group for the average mean score.

The lowest mean scores decrease was 1 point and the highest increase was 5 points for the male control group while the lowest percentage decrease was 3 percent and the highest increase was 11 percent. The male experimental group had a range from minus 1 point to plus 5 points for mean scores and from minus 3 percent to plus 11 percent for percentages.

The range for the female control group was from a decrease of 1 point to an increase of 2 points for mean scores and from a decrease of 2 percent to an increase of 5 percent for percentages. The female experimental group had an increase range from 2 points to 6 points for mean scores and from 6

Table 10

Pretest Means, Posttest Means, Mean Scores Increase or Decrease, and Percentages of Increase or Decrease for Illinois Test of Psycholinguistic Abilities Test-Retest by Sex by Group for Grade 3

Sex and Groups	Pretest Means	Posttest Means	Mean Scores Increase or Decrease	Percentages Increase or Decrease
<u>Males</u>				
Control Group				
ID 28	38	37	-1	- 3%
ID 29	39	39	0	0%
ID 30	35	40	+5	+14%
Average Increase			<u>1</u>	
Experimental Group				
ID 31	43	48	+5	+11%
ID 32	36	35	-1	- 3%
ID 33	35	39	+4	+11%
Average Increase			<u>3</u>	
<u>Females</u>				
Control Group				
ID 25	42	41	-1	- 2%
ID 26	40	42	+2	+ 5%
ID 27	40	42	+2	+ 5%
Average Increase			<u>1</u>	

Table 10 (continued)

Sex and Groups	Pretest Means	Posttest Means	Mean Scores Increase or Decrease	Percentages Increase or Decrease
Experimental Group				
ID 34	35	37	+2	+ 6%
ID 35	36	42	+6	+17%
ID 36	33	39	+6	+18%
Average Increase			<u>5</u>	

Note. Increase +; decrease -  
 Male control group n = 3  
 Male experimental group n = 3  
 Female control group n = 3  
 Female experimental group n = 3

percent to 18 percent for percentages.

Means, mean scores increase or decrease, and percentages of increase or decrease for the composite control group and the composite experimental group for grade levels one, two, and three are presented in Table 11. The average mean score increase for the composite control group was 2 points, while the average mean score increase for the composite experimental group was 5 points. The composite experimental group had more than two times as much increase for the average mean score as the composite control group.

The range for mean scores was from a decrease of 1 point to an increase of 5 points for the composite control group with a range of minus 3 percent to plus 17 percent. The composite experimental group had a range for mean scores from minus 1 point to plus 9 points and from a minus 6 percent to plus 27 percent.

Table 12 contains the mean scores, mean scores increase or decrease, and percentages of increase or decrease for males and females in the composite control group and the composite experimental group for grade levels one, two, and three. The average mean score increase was 2 points for the male composite control group. The male composite experimental group had an average mean increase of 4 points. The male composite experimental group had a greater increase for the average mean score than the male composite control group.

Table 11

Pretest Means, Posttest Means, Mean Scores Increase or Decrease, and Percentages of Increase or Decrease for Illinois Test of Psycholinguistic Abilities Test-Retest by Groups for Composite of Grade Levels One, Two, and Three

Groups	Pretest Means	Posttest Means	Mean Scores Increase or Decrease	Percentages Increase or Decrease
Control Group				
ID 1	35	38	+3	+ 9%
ID 2	45	47	+2	+ 4%
ID 3	34	39	+5	+15%
ID 4	33	35	+2	+ 6%
ID 5	44	44	0	0%
ID 6	41	43	+2	+ 5%
ID 13	40	45	+5	+13%
ID 14	35	40	+5	+14%
ID 15	43	44	+1	+ 2%
ID 16	41	42	+1	+ 2%
ID 17	37	41	+4	+11%
ID 18	30	35	+5	+17%
ID 25	42	41	-1	- 2%
ID 26	40	42	+2	+ 5%
ID 27	40	42	+2	+ 5%
ID 28	38	37	-1	- 3%
ID 29	39	39	0	0%
ID 30	35	40	+5	+14%
Average Increase			$\frac{+5}{2}$	

Table 11 (continued)

Groups	Pretest Means	Posttest Means	Mean Scores Increase or Decrease	Percentages Increase or Decrease
Experimental Group				
ID 7	34	43	+9	+26%
ID 8	34	40	+6	+17%
ID 9	42	42	0	0%
ID 10	27	36	+9	+33%
ID 11	36	34	-2	- 6%
ID 12	33	42	+9	+27%
ID 19	38	41	+3	+ 8%
ID 20	38	43	+5	+13%
ID 21	33	42	+9	+27%
ID 22	34	37	+3	+ 9%
ID 23	43	47	+4	+ 9%
ID 24	41	45	+4	+10%
ID 31	43	48	+5	+11%
ID 32	36	35	-1	- 3%
ID 33	35	39	+4	+11%
ID 34	35	37	+2	+ 6%
ID 35	36	42	+6	+17%
ID 36	33	39	+6	+18%
Average Increase			<u>5</u>	

Note. Increase +; decrease -  
Control group n = 18  
Experimental group n = 18

Table 12

Pretest Means, Posttest Means, Mean Scores Increase or Decrease, and Percentages of Increase or Decrease for Illinois Test of Psycholinguistic Abilities Test-Retest by Sex by Composite Group of Grade Levels One, Two, and Three

Sex and Groups	Pretest Means	Posttest Means	Mean Scores Increase or Decrease	Percentages Increase or Decrease
<u>Males</u>				
Control Group				
ID 4	33	35	+2	+ 6%
ID 5	44	44	0	0%
ID 6	41	43	+2	+ 5%
ID 13	40	45	+5	+13%
ID 17	37	41	+4	+11%
ID 18	30	35	+5	+17%
ID 28	38	37	-1	- 3%
ID 29	39	39	0	0%
ID 30	35	40	+5	+14%
Average Increase			$\frac{2}{2}$	

Table 12 (continued)

Sex and Groups	Pretest Means	Posttest Means	Mean Scores Increase or Decrease	Percentages Increase or Decrease
<b>Experimental Group</b>				
ID 10	27	36	+9	+33%
ID 11	36	34	-2	- 6%
ID 12	33	42	+9	+27%
ID 22	34	37	+3	+ 9%
ID 23	43	47	+4	+ 9%
ID 24	41	45	+4	+10%
ID 31	43	48	+5	+11%
ID 32	36	35	-1	- 3%
ID 33	35	39	+4	+11%
Average Increase			<u>4</u>	
<b>Females</b>				
<b>Control Group</b>				
ID 1	35	38	+3	+ 9%
ID 2	45	47	+2	+ 4%
ID 3	34	39	+5	+15%
ID 14	35	40	+5	+14%
ID 15	43	44	+1	+ 2%
ID 16	41	42	+1	+ 2%
ID 25	42	41	-1	- 2%
ID 26	40	42	+2	+ 5%
ID 27	40	42	+2	+ 5%
Average Increase			<u>2</u>	



Table 12 (continued)

Sex and Groups	Pretest Means	Posttest Means	Mean Scores Increase or Decrease	Percentages Increase or Decrease
Experimental Group				
ID 7	34	43	+9	+26%
ID 8	34	40	+6	+17%
ID 9	42	42	0	0%
ID 19	38	41	+3	+ 8%
ID 20	38	43	+5	+13%
ID 21	33	42	+9	+27%
ID 34	35	37	+2	+ 6%
ID 35	36	42	+6	+17%
ID 36	33	39	+6	+18%
Average Increase			<u>5</u>	

Note. Increase +; decrease -  
 Male control group n = 9  
 Male experimental group n = 9  
 Female control group n = 9  
 Female experimental group n = 9

The average mean score increase for the female composite control group was 2 points while the female composite experimental group had an average mean score increase of 5 points. The female composite experimental group had more than three times as much increase for the average mean score as the female composite control group.

The mean scores increase for the male composite control group ranged from 0 to 5 points with percentages of increase from 0 to 17 percent. The male experimental group ranged from minus 2 points to plus 9 points on mean scores increase with percentages ranging from minus 6 percent to plus 33 percent.

The female composite control group ranged from a decrease of 1 point to an increase of 5 points for mean scores with percentages ranging from a decrease of 2 percent to an increase of 15 percent. The range for the female composite experimental group on mean scores increase was from 0 to 9 points and on percentages of increase from 0 to 27 percent.

### Statistical Analysis of Results

Data compiled from the pretest and posttest for each subject were keypunched into IBM eighty-column cards and read into the IBM 360, Version H memory bank operating under the DOS system at the East Tennessee State University Computer Center. The input format provided for five variables which were read by the computer. The variables were ID (subject's

identification number), grade (one, two, or three), group (control or experimental), pre (pretest mean), and post (posttest mean).

One record card was punched per case. A maximum of fifteen columns were used on a record. The input medium was a card, the number of cases was thirty-six, and the breakdown was tables for pre, post, by group by grade.

Data were analyzed by the Statistical Package for the Social Sciences (SPSS) to compute the analysis of covariance. The level of significance for the rejection of the null hypotheses was set at  $P \leq 0.05$ .

The analysis of covariance summary for grade level one, Table 13, revealed no significant difference between the scores achieved by the experimental group and the control group on the Illinois Test of Psycholinguistic Abilities. The first null hypothesis was accepted.

Table 13  
Analysis of Covariance of Posttest by  
Groups with Pretest Grade 1

Source of Variation	Sums of Squares	Degrees of Freedom	Means of Squares	F	Significance of F
Between	6.632	1	6.632	1.132	0.315 n.s.d.
Within	52.741	9	5.860		
Total	150.917	10			

Note. n = 12; k = 2

The analysis of covariance summary for grade level two, Table 14, showed no significant difference between the scores achieved by the experimental group and the control group on the Illinois Test of Psycholinguistic Abilities. The second null hypothesis was accepted.

Table 14  
Analysis of Covariance of Posttest by  
Groups with Pretest Grade 2

Source of Variation	Sums of Squares	Degrees of Freedom	Means of Squares	F	Significance of F
Between	4.429	1	4.429	1.376	0.271 n.s.d.
Within	28.976	9	3.220		
Total	127.667	10			

Note.  $n = 12$ ;  $k = 2$

The analysis of covariance summary for grade level three, Table 15, presented no significant difference between the scores achieved by the experimental group and the control group on the Illinois Test of Psycholinguistic Abilities. The third null hypothesis was accepted.

The analysis of covariance summary for the composite groups, Table 16, revealed no significant difference between the scores achieved by the composite experimental group and the composite control group on the Illinois Test of Psycholinguistic Abilities. The fourth null hypothesis was accepted.

Table 15  
Analysis of Covariance of Posttest by  
Groups with Pretest Grade 3

Source of Variation	Sums of Squares	Degrees of Freedom	Mean of Squares	F	Significance of F
Between	7.413	1	7.413	1.190	0.304 n.s.d.
Within	56.053	9	6.228		
Total	117.667	10			

Note. n = 12; k = 2

Table 16  
Analysis of Covariance of Posttest by  
Groups with Pretest Composite

Source of Variation	Sums of Squares	Degrees of Freedom	Means of Squares	F	Significance of F
Between	18.666	1	18.666	3.913	0.056 n.s.d.
Within	157.413	33	4.770		
Total	415.637	34			

Note. n = 36; k = 2

### Summary

Chapter 4 contained the presentation of data and the statistical analysis of results of the study. The presentation of data provided information compiled for each subject on the pretest and posttest. The data were illustrated in

tables. The statistical analysis of results was discussed and illustrated in tables. It was found that the null hypotheses were accepted at the 0.05 level of significance. Chapter 5 describes the summary, conclusions, and recommendations of the study.

## Chapter 5

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### Introduction

The problem of this study was to determine whether selected psycholinguistic instructional aids were effective in remediating learning deficiencies among early elementary children (grades 1-3).

Literature was reviewed to substantiate a need for the use of psycholinguistic instructional aids for remediation of learning deficiencies among early elementary children. Research surveyed included auditory perception skills, language skills, motor skills, and visual perception skills.

The revised battery of the Illinois Test of Psycholinguistic Abilities which contained ten basic tests and two supplementary tests was selected as the pretest and posttest for the study. The test was chosen for its dual ability to act as an evaluation model and also as a selection and programming model for remedial psycholinguistic instruction.

The data were collected from test groups of students in grade levels one, two, and three. A stratified random sampling technique yielded a sample of thirty-six students, eighteen males and eighteen females. Each of the three grade level groups was divided randomly into two groups containing an equal number of males and females. These groups were labeled

the experimental groups and control groups.

Twenty-one thirty-minute sessions of prescribed psycholinguistic instructional aids were provided the experimental groups at the same time twenty-one sessions of "pseudo" treatment were provided the control groups during the fall of 1980.

### Summary of the Findings

The following findings were developed from the results of data analysis and interpretation. The findings were reported as they pertained to each of the research hypotheses originally formulated.

The gain between the scores achieved on the Illinois Test of Psycholinguistic Abilities by the experimental group and the control group in grade level one was tested in hypothesis one. The analysis of covariance revealed no significant difference in the scores of the two groups at the 0.05 level of significance.

The experimental group for grade level one had a gain of more than two times that of the control group. The male experimental group had an increase of five times that of the male control group, while the female experimental group had a larger increase as compared to the female control group.

The gain between the scores achieved on the Illinois Test of Psycholinguistic Abilities by the experimental group and the control group in grade level two was tested in



hypothesis two. No significant difference was found between the groups by the analysis of covariance at the 0.05 level of significance.

The gain difference for the experimental group and the control group for grade level two showed a slight increase for the experimental group. The male control group, however, had a slightly higher increase than the male experimental group. The female experimental group increased three times that of the female control group.

The gain between the scores achieved on the Illinois Test of Psycholinguistic Abilities by the experimental group and the control group in grade level three was tested in hypothesis three. An analysis of covariance at 0.05 level of significance revealed no significant difference between the experimental group and the control group.

The experimental group in grade level three had an increase of four times that of the control group. The male experimental group had an increase three times higher than the male control group, while the female experimental group had a gain of five times that of the female control group.

The gain between the scores achieved on the Illinois Test of Psycholinguistic Abilities by the composite experimental group and the composite control group for grade levels one, two, and three was tested in hypothesis four. No significant difference was found through an analysis of covariance at the 0.05 level of significance between the

composite experimental group and the composite control group.

The composite experimental group had an increase of more than two times that of the composite control group. The male composite experimental group had an increase of twice that of the male composite group. The female composite group gained almost three times that of the female composite control group.

### Conclusions

The following conclusions were drawn from the results of the study:

1. The study failed to reveal significant differences between the experimental groups and the control groups due to remediation of learning deficiencies by use of psycholinguistic instructional aids.
2. The experimental groups for grade levels one, two, and three showed an increase over the control groups for grade levels one, two, and three.
3. The male experimental groups showed an increase over the male control groups with the exception of the second grade level where the control group was slightly favored.
4. The female experimental groups showed an increase over the female control groups in all grade levels.
5. The composite experimental group for grade levels one, two, and three showed an increase over the composite control group for grade levels one, two, and three.

6. The female experimental groups, including the composite female experimental group, showed a gain over the male experimental groups.

### Implications

The following implications were drawn from the results of the study:

1. The indication that no significant differences were found by the computation of the data collected in the study does not mean that change did not take place. Change was demonstrated by individual gains. The individual improvements should not be taken lightly but should serve as a means for follow-up remediation and study.

2. There seemed to be a possibility that the short duration of remediation and/or the size of the sample were not sufficient to produce marked improvements.

3. There was a possibility that some students scored at the level where little gain was achieved after remediation. The reverse, however, was a possibility for those who scored lower initially.

4. There was an apparent need for psycholinguistic remediation among young children before learning problems become too entrenched. Conversations with instructors and parents reflected this need. The use of psycholinguistic instructional aids, therefore, should be stressed and encouraged in the early elementary years.

### Recommendations

The following recommendations were made as a result of the study:

1. Additional studies should be conducted using larger samples and/or longer durations of time to determine whether selected psycholinguistic instructional aids were effective in remediating learning deficiencies.

2. Replication of the study should be made in other geographical areas using different research designs and methodologies in order to increase the ability to generalize the results.

3. Studies should be conducted with middle and upper elementary school children to determine whether psycholinguistic instructional aids were effective for the remediation of learning deficiencies at those grade levels.

4. Schools should use evaluation instruments such as the Illinois Test of Psycholinguistic Abilities to assess students' psycholinguistic abilities and incorporate the findings into staff development programs and professional growth activities.

5. Studies should be conducted on the impact of psycholinguistic instruction on students' self-concepts.

6. Studies should be conducted to determine if paraprofessionals could enhance students' psycholinguistic performance.

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## **APPENDICES**

APPENDIX A

PUBLIC LAW 94-142

## PUBLIC LAW 94-142

The Education for All Handicapped Children Act, Public 94-142, mandates a free appropriate public education for each exceptional child. Within the Federal law, a legal framework has established the following mandates:

All exceptional children and their parents shall be guaranteed due process with regard to identification, evaluation, and placement procedures.

A written, individualized educational program shall be developed for each child determined to have special educational needs.

Educational placement decisions for each exceptional child shall always be in the least restrictive environment appropriate to the child's learning needs.

Responsibility for providing the appropriate educational program for each child rests with the local education agency.

A periodic review shall be conducted by the education agency at least annually to evaluate the exceptional child's progress and to rewrite the educational plan.

**APPENDIX B**

**INSTITUTIONAL REVIEW BOARD**





## 9. TYPE OF PROJECT OR STUDY (Check most applicable type)

- a. ☐ Medical-Therapeutic (Evaluation of drugs, treatment protocol, surgical procedure, etc.)
- b. ☐ Medical-Non-Therapeutic (Physiological studies, laboratory analyses of normal blood or other substances)
- c. ☒ Behavioral, Non-Manipulative (Evaluation of subject response to educational methods or material, Psychological profiles, Attitudinal survey, etc.)
- d. ☐ Behavioral, Manipulative (Behavior modification, response to stressful stimuli, etc.)

## 10. ATTACHMENT CHECKLIST

☒ A. NARRATIVE DESCRIPTION OF PROJECT: (Concise, but must include each of following areas)

1. Project Title
2. Place to be conducted
3. Specific objectives of project
4. Summary of project, and copies of any questionnaires, etc. to be administered.
5. Specific role of human subject involved, i.e. characteristics of study population, procedures used in selection, what will be done to them.
6. Specific risks to subjects, including physical, psychological and social risks.
7. Benefits expected to subjects, investigators, community, etc.
8. What inducements, if any, will be offered the subjects.
9. Subject confidentiality (will subject identification be kept confidential; if so, how).
10. Informed consent procedure to be utilized.
11. Procedure to be followed in handling and reporting adverse reactions.
12. Pertinent literature references (maximum of ten).

☒ B. COMPLETED COPY OF INFORMED CONSENT FORM (IRB FORM NO. 106).

☐ C. STATEMENT OF APPROVAL FROM SUBCOMMITTEE ON RADIOACTIVE MATERIALS, if applicable.

☐ D. INVESTIGATIONAL DRUG INFORMATION SUMMARY, if applicable.

N/A E. APPROVAL RECOMBINANT DNA COMMITTEE, if applicable.

XX F. APPROVAL SIGNATURE OF DEPARTMENT CHAIRPERSON, DIVISION HEAD OR DEAN

11. ASSURANCE OF PRINCIPAL INVESTIGATOR

The information contained in this project review proposal accurately represents the activities of this project involving human subjects. I will promptly inform the Institutional Review Board of (1) any significant changes in the project with respect to human subject participation; (2) any adverse reactions or unexpected responses observed involving human subjects; (3) any continuation of the project activities beyond the period stated in this request.

DATE May 20, 1980

Janice Sutherland Williams  
Principal Investigator

May 20, 1980

Janice Sutherland Williams  
Principal Investigator

**APPENDIX C**  
**INFORMED CONSENT FORM**

East Tennessee State University  
Institutional Review Board

Informed Consent Form

PRINCIPAL INVESTIGATOR: Janice Southerland Williams

TITLE OF PROJECT: An Analysis of Selected Psycholinguistic  
Instructional Aids for the Remediation of Learning  
Deficiencies Among Early Elementary Children

- 1) Indicated below are the (a) purpose of this study,  
(b) the procedures to be followed, and (c) the approxi-  
mate duration of this study:

Your child \_\_\_\_\_ is invited to

(Full name of the child)

participate in a study to be designed by Mrs. Janice Southerland Williams, an instructor in the primary unit of the University School and a doctoral student in the College of Education. The purpose of this study is to assess reading ability and by the use of special instructional techniques attempt to reduce reading deficiencies which are found. If your child, with your approval, chooses to participate in the study, he or she will be tested and provided regular and special reading instruction as a part of the school's regular schedule of instruction. The study will continue approximately ten to twelve weeks. Regular attendance is encouraged. There are no risks to the student, and should you or your child not wish to participate, there is no jeopardy involved academically or otherwise.

- 2) Discomforts, inconveniences and/or risks that can be reasonably expected are:

There will be no discomforts, inconveniences, or risks involved in the study. Confidentiality as to the identity of the student subjects will be maintained in accordance with strict research procedure. The student and/or his or her parents may decline the invitation to participate with no academic or personal jeopardy.

- 3) I understand the procedures to be used in this study and the possible risks involved. All my questions have been answered. I also understand that while my rights and privacy will be maintained, the Secretary of the Department of Health, Education and Welfare does have free access to any information obtained in this study should it become necessary and I freely and voluntarily choose to participate. I understand that I may withdraw at any time without prejudice to me. I also understand that while East Tennessee State University

does not provide compensation for medical treatment other than emergency first aid, for any physical injury which may occur as a result of my participation as a subject in this study, claims arising against ETSU or any of its agents or employees may be submitted to the Tennessee State Board of Claims for disposition to the extent allowable as provided under TCA Section 9-812. Further information concerning this may be obtained from the chairman of the Institutional Review Board.

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Date

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Signature of Student

---

Date

---

Signature of Parents or Guardian

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*Sept. 3, 1980*

Date

---

*Jennie S. Williams*

Signature of Investigator

---

*Sept. 3, 1980*

Date

---

*A. Keith Overholser*Signature of Directing Professor  
East Tennessee State University

APPENDIX D

INDIVIDUAL PSYCHOLINGUISTIC INSTRUCTIONAL  
AID FORM

Teacher's Name \_\_\_\_\_

Child's Name \_\_\_\_\_

Psycholinguistic Deficiency  
Remediated \_\_\_\_\_Psycholinguistic Instructional  
Aid Prescribed \_\_\_\_\_

A. Objective

B. Materials Needed

C. Procedure Used

D. Product Expected

## **APPENDIX E**

### **TABULATION OF PSYCHOLINGUISTIC AIDS USED BY THE EXPERIMENTAL GROUPS**



Tabulation of Psycholinguistic Aids  
Used by the Experimental Groups\*

The control groups in the study were presented twenty-one thirty-minute sessions of individually prescribed psycholinguistic aids drawn from Aids to Psycholinguistic Teaching by Wilma Jo Bush and Marian T. Giles, published in 1977 by Charles E. Merrill, Columbus, Ohio. The aids were developed around the twelve areas contained in the Illinois Test of Psycholinguistic Abilities.

I. Auditory Reception

- A. Identify Nonsense Words (5)\*\*
- B. Read Aloud a Story/Answer Questions (25)
- C. Determine Answers from Verbal Descriptions (4)
- D. Respond to "Yes," "No," or "Maybe" Questions (8)
- E. Play "Simon Says" (2)
- F. Play "I Say Stoop" (2)
- G. Follow Directions for Drawing Activities (5)
- H. Respond to Riddles (2)
- I. Play "Career Game" (2)
- J. Follow Directions for Writing Activities (5)
- K. Identify Familiar Sounds (2)
- L. Identify Objects by Verbal Descriptions (4)

II. Visual Reception

- A. Play "Eye-Openers" (2)
- B. Recall Articles Seen (2)
- C. Draw Something That Begins with Given Initial Sounds (2)
- D. Select Beginning Sounds for Pictures (2)
- E. Illustrate Verbal Descriptions (2)
- F. Identify Numbers and Geometric Forms Through Construction Activities (2)
- G. Complete Pictures by Connecting Dots (5)
- H. Identify and Describe Pictures (2)

\* The control groups participated in regular classroom activities. No attempt was made to tabulate the activities.

\*\* The number in the parentheses represents the number of times the aid was used.

### III. Auditory Association

- A. Identify Likenesses and Differences in Words (2)
- B. Identify Likenesses and Differences in Objects (4)
- C. Solve Problems (10)
- D. Categorize and Classify Objects (8)
- E. Use Analogies (2)
- F. Recognize Cause and Effect (2)
- G. Identify Incongruities in Sentences (2)
- H. Identify Words Beginning with Particular Sounds (2)
- I. Find Opposites (2)
- J. Choose Proper Word from Two Choices (2)
- K. Complete Sentences With Rhyming Words (3)

### IV. Visual Association

- A. Interpret Relationships (8)
- B. Sort Objects (2)
- C. Find Identical Pictures (6)
- D. Reproduce and Create Designs on Pegboards (2)
- E. Recognize What Is Wrong in Pictures (2)
- F. Form Opposite Pairs (2)
- G. Recognize Incongruities in Sets of Pictures (3)
- H. Arrange Pictures to Tell Stories (4)

### V. Verbal Expression

- A. Play "Going Places" (6)
- B. Play Rhyming Games (9)
- C. Tell How and Why (17)
- D. Respond to Questions in Complete Sentences (19)
- E. Describe Objects by Color (2)
- F. Describe Objects in "Our Surprise Bag" (6)
- G. Describe Pictures or Happenings (19)
- H. Give Directions (12)
- I. Describe Personal Belongings (2)
- J. Tell What (2)
- K. Associate Words by Rhyming (2)
- L. Tell Which (8)
- M. Describe Objects (7)
- N. Play "I Spy" (3)
- O. Complete Telephone Conversations (5)
- P. Participate in Choral Reading (5)
- Q. Play "What Happened Game" (4)
- R. Play "The Zoo Game" (3)
- S. Play "My Rocket Game" (3)

## VI. Manual Expression

- A. Demonstrate Motor Activities With Gestures (6)
- B. Trace Designs (2)
- C. Act Out Fingerplays (4)
- D. Put Finger to Lips Upon Hearing Particular Sounds (2)
- E. Act Out Roles in Charades (2)
- F. Perform Pantomimes (3)
- G. Sing and Gesture to Singing Games (4)
- H. Play "Simon Says" (4)
- I. Make Gestures for Action Rhymes (5)
- J. Play "I Say Stoop" (3)
- K. Write Letters in Air (2)
- L. Act Out Movements for Stories (4)

## VII. Grammatical Closure

- A. Repeat and Complete Sentences (9)
- B. Respond to Incomplete Sentences with Anticipated Rhyming Words (4)
- C. Supply "Is" or "Are" in Incomplete Sentences and Repeat Sentences (4)
- D. Answer Riddles in Complete Sentences (3)
- E. Say Words That "Go With" Given Words (3)
- F. Play "Finish My Rhyme" (3)
- G. Supply Plurals in Sentences (2)
- H. Fill in Missing Words in Stories (10)
- I. Give Words for Objects/Respond with Rhyming Words (4)

## VIII. Visual Closure

- A. Identify Object and Assemble Pieces (5)
- B. Trace and Supply Missing Letters in Words (6)
- C. Complete Stick Figures (12)
- D. Complete Partial Letters (2)
- E. Complete Partial Forms (6)
- F. Identify Hidden Pictures in Abstract Designs (15)
- G. Identify Incomplete Representations of Familiar Objects (13)
- H. Complete Dot-to-Dot Pictures (17)
- I. Put Together Puzzles (15)
- J. Fold and Cut Paper by Directions (2)
- K. Tell What Is Missing from Pictures (2)
- L. Read Graphs (10)
- M. View Objects Through Mirror/Place Objects in Original Order (5)

## IX. Auditory Sequential Memory

- A. Repeat Rhyming Words in Sequence (4)
- B. Repeat Sentences Verbatim (4)
- C. Repeat Sequence of Letters, Numbers, and Words (2)
- D. Identify and Repeat in Sequence Sounds Heard (2)
- E. Repeat Telephone Numbers (2)
- F. Repeat Non-Ordered Letter Combinations and Words (4)
- G. Repeat Funny Sentences (3)
- H. Repeat Rhymes (4)
- I. Repeat Word Sequences Verbatim and Tell Relationships (2)
- J. Supply Rhyming Words (2)

## X. Visual Sequential Memory

- A. Place Pictures in Sequence (17)
- B. Complete Dot-to-Dot Pictures (26)
- C. Complete Mazes (33)
- D. Find Hidden Pictures (37)
- E. Place Story Events in Sequence (19)
- F. Recall Objects Seen (8)
- G. Name Objects in Sequence (5)
- H. Place Objects in Original Order (8)
- I. Complete Stick Figures (2)
- J. Read and Spell Basic Sight Words (2)
- K. Complete Search-a-Word Puzzles (23)
- L. Find Hidden Pictures in Abstract Designs (3)
- M. Identify and Color Geometric Shapes (2)
- N. Place Sentences in Sequence (5)
- O. Play Arms and Hands Action Memory Games (10)
- P. Place "Scrambled" Children in Order (15)
- Q. Repeat Hand Signals in Sequential Order (5)
- R. Complete Dot-to-Dot Patterns (5)
- S. Copy Geometric Pictures (4)
- T. Trace Patterns (6)

## XI. Auditory Closure

- A. Identify Beginning Sounds (4)
- B. Identify Ending Sounds (2)
- C. Use Singular and Plural Words (2)
- D. Identify Rhyming Words (3)
- E. Complete Missing Words in Stories (2)
- F. Use Verb Tenses (2)
- G. Identify Consonant Sounds (2)
- H. Pair Responses (2)
- I. Complete Prelearned Sentence Segments (2)
- J. Repeat Complete Sentences After Words Omitted (2)
- K. Rhyme Objects by Association (2)

- L. Rhyme Words by Association (4)
- M. Say Rhyming Words Which Fit Pictures (4)
- N. Recognize Correct Word Forms in Sentences (9)
- O. Complete Sentences (4)
- P. Identify Missing Parts of Words (10)
- Q. Identify Words with Same Ending Sounds (4)
- R. Complete Missing (Common to All Sentences) Words in Sentences (4)
- S. Identify Missing Rhyming Words in Couplets (4)

## XII. Sound Blending

- A. Pronounce Words and Identify Corresponding Pictures (2)
- B. Add Sounds of /s/ and /ed/ to Ends of Words (2)
- C. Pronounce Sound-Blending Words and Find Corresponding Objects in Classroom (2)
- D. Say Names of Objects and Match Rhyming Words (2)

**APPENDIX F**  
**CORRESPONDENCE**

1510 Crystal Springs Drive  
Johnson City, TN 37601  
May 26, 1980

Mr. James E. Francis  
Director  
University School  
East Tennessee State University  
Johnson City, Tennessee 37601

Dear Mr. Francis:

I am currently working toward the completion of the requirements for the degree, Doctor of Education, at East Tennessee State University. My research project deals with psycholinguistic instructional aids for the remediation of learning deficiencies among early elementary children.

With your permission, I wish to work with the children and teachers in grade levels one, two, and three at the University School. The teachers who would be involved are Miss Elaine Gerace, Mrs. Novice Gross, and Mrs. Janice Williams. Data collection would be scheduled for fall, 1980. All results of the study will be made available to you.

Sincerely yours,

*Janice Southerland Williams*

Janice Southerland Williams  
Project Director



**East Tennessee State University**

University School • Box 21460A • Johnson City, Tennessee 37614 • (615) 929-4333, 4271

May 26, 1980

Mrs. Janice Southerland Williams  
East Tennessee State University  
Johnson City, TN 37601

Dear Mrs. Williams:

It is a pleasure to grant permission for you to do a research project at University School beginning in the fall of 1980. Miss Gerace and Mrs. Gross, as you already know, will be excellent teachers to assist you with the project.

I wish you the best of luck for the project and also for the 1980-81 school year.

Sincerely,

James E. Francis, Director



1510 Crystal Springs Drive  
Johnson City, TN 37601  
June 10, 1980

Miss Elaine Gerace  
Supervising Teacher, Level 1  
University School  
East Tennessee State University  
Johnson City, Tennessee 37601

Dear Miss Gerace:

I am currently working toward the completion of the requirements for the degree, Doctor of Education, at East Tennessee State University. My research project deals with psycholinguistic instructional aids for the remediation of learning deficiencies among early elementary children.

With your permission, I wish to work with you and the children enrolled in grade level one. This project has the approval of the Director of the University School. Data collection would be scheduled for fall, 1980.

Your assistance in the research project would be greatly appreciated. All results of the study will be made available to you.

Sincerely,

*Janice Southerland Williams*

Janice Southerland Williams  
Project Director

**East Tennessee State University**

University School • Box 21460A • Johnson City, Tennessee 37614 • (615) 929-4333, 4271

July 15, 1980

Mrs. Janice Southerland Williams  
East Tennessee State University  
Johnson City, TN 37614

Dear Mrs. Williams,

It is with pleasure that I grant my permission for you to work with me and the students in grade one. I look forward to working with you and to being a part of your research project dealing with psycholinguistic instructional aids for the remediation of learning deficiencies among early elementary children.

Be assured that I will do my best to work toward the successful completion of the research. My very best wishes for a successful project.

Sincerely,

*Elaine Gerace*

Elaine Gerace

1510 Crystal Springs Drive  
Johnson City, TN 37601  
June 10, 1980

Mrs. Novice Gross  
Supervising Teacher, Level 2  
University School  
East Tennessee State University  
Johnson City, Tennessee 37601

Dear Mrs. Gross:

I am currently working toward the completion of the requirements for the degree, Doctor of Education, at East Tennessee State University. My research project deals with psycholinguistic instructional aids for the remediation of learning deficiencies among early elementary children.

With your permission, I wish to work with you and the children enrolled in grade level two. This project has the approval of the Director of the University School. Data collection would be scheduled for fall, 1980.

Your assistance in the research project would be greatly appreciated. All results of the study will be made available to you.

Sincerely,

*Janice Southerland Williams*

Janice Southerland Williams  
Project Director

**East Tennessee State University**

University School • Box 21460A • Johnson City, Tennessee 37614 • (615) 929-4333, 4271

June 12, 1980

Mrs. Janice Southerland Williams  
East Tennessee State University  
Johnson City, Tennessee 37601

Dear Mrs. Williams,

I will be pleased to work with you in your research project concerning psycholinguistic aids for early elementary children. Please know that you will have my utmost cooperation and assistance in this endeavor.

I am looking forward to the opportunity of beginning this project.

Sincerely,

A handwritten signature in cursive script that reads "Novice Hendrix Gross".

Novice Hendrix Gross

## VITA

**JANICE SOUTHERLAND WILLIAMS**

Personal Data:      Date of Birth:      February 5, 1934  
                         Place of Birth:      Lakeland, Florida  
                         Marital Status:      Married

Education: Public Schools, Lakeland, Florida  
Florida State University, Tallahassee,  
Florida; elementary education, B.S., 1956.  
East Tennessee State University, Johnson  
City, Tennessee; elementary education,  
M.A., 1973.  
East Tennessee State University, Johnson  
City, Tennessee; educational supervision,  
Ed.D., 1981.

Professional Experience:

Teacher, Webster Avenue Elementary School,  
Lakeland, Florida, 1956.

Teacher, Bainbridge Elementary School,  
Bainbridge, Maryland, 1957.

Teacher, Southwest Elementary School,  
Lakeland, Florida, 1957-1958.

Teacher, Stephen Foster Elementary School,  
Gainesville, Florida, 1958-1959.

Teacher, Glen Haven Elementary School,  
Silver Spring, Maryland, 1959-1960.

Intern, Supervisor of Reading, Greene County,  
Greeneville, Tennessee,

Intern, Supervisor of Mathematics, Greene  
County, Greeneville, Tennessee

Instructor, Department of Education, College  
of Education, East Tennessee State  
University, Johnson City, Tennessee,  
Summer 1977.

Supervising Instructor, University School,  
College of Education, East Tennessee  
State University, Johnson City, Tennessee,  
1976-1981.

Honors and Awards: Phi Kappa Phi, East Tennessee State University  
Kappa Delta Pi, Florida State University  
Phi Delta Kappa, East Tennessee State University  
Delta Kappa Gamma, Johnson City  
Community Leaders and Noteworthy Americans, 1978  
Personalities of America, 1978  
Community Leaders of America, 1980